MODELLING IN RANKING PROCEDURES; A CASE STUDY: INFRASTRUCTURE FAILURES IN NIGERIA

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Abstract: The lack of a scientific approach as to which factors are considered or chosen in a decision-making process can seriously influence the effectiveness of that process. Using the example of infrastructure failures in Nigeria, this paper presents a severity index in matrix order (SIMO) model that unambiguously ranks factors and also defines a threshold that demarcates between major variable factors that should not be compromised in policy and less important ones. Infrastructures failures in Nigeria have hindered economic processes which were meant to alleviate poverty. Constraints responsible for this situation are identified from a carefully conducted survey in Nigeria. Severity of these constraints is empirically ranked using a developed severity index in matrix order (SIMO) model. However, the investigation reveals that corruption, misallocation of investments, inadequate maintenance, lack of transparency and accountability, insufficient funding for infrastructure, lack of supportive institutions, inconsistent political, social and economic policies and the lack of suitable technical and managerial skill are the major variable factors responsible for infrastructure failures in Nigeria.

Key words: Modelling, Ranking, Severity-index, Failures, Infrastructure, Nigeria

1. INTRODUCTION

Decision-making processes need a clear understanding of factors involved and how they affect the process being considered (Levine et al., 1999). A ranking procedure is an effective way of knowing the relative importance of these factors (Clarke and Cooke, 1992; Levine et al., 1999). Various ranking techniques for example severity index, prioritisation technique and frequency counts have been used in previous studies (Aniekwu, 1995; Mansfield et al., 1994; Foster, 2001).

However, when factors are identified and ranked according to severity, policy makers are often left in a dilemma as to how to identify the point of demarcation between the major variable factors that can not be compromised in policy and those to be considered minor. This is because it is practically impossible to make provision that is proportionate to the level of severity for each factor during policy formulation. Nevertheless, an arbitrary selection of "relevant" factors - as is common in the decision-making process - could be considered an interference in a due statistical process and thus could be classed as a "bias". It is the view of the authors that an unscientific selection of factors and the exclusion of a demarcation point in ranking procedure leave the process inconclusive. Making a demarcation point that is unbiased leads decision makers to an impartial, systematic conclusion.

Generally, ranking procedure is affected by frequency count, the order of priority made by respondents and occasional multiple occurrences of factors in different ranking positions as explained in the methodology of this study. However, if these aspects are not adequately accommodated in the ranking procedure, it becomes unreliable and at best inconclusive. Thus, it is the objective of this paper to present a developed Severity Index in Matrix Order (SIMO) model that can cater for the identified anomalies in ranking procedures using a case study of infrastructure failures in Nigeria (a part of an ongoing PhD research in the School of Architecture, De Montfort University). However, a brief definition of infrastructure is necessary at this stage to adequately introduce the case study.

Infrastructure is an encapsulation of social overhead capital with subsequent potentials for economies of scale and huge externalities i.e. its ability to decrease unit cost of production with increasing output over a wide range and the tendency to spillover its effects from users to non users (World Bank, 1994; Yoshino and Nakahigashi, 2000). The foregoing gives credence to the general understanding of Infrastructure as being the underlying framework which enhances the effective functioning of any system or organization (Ostrom et al., 1993; Webster.s Reference, 2002).

Nonetheless, what constitutes effective functioning of an organisation or system is the extent to which growth and economic development is sustainable (Ostrom et al., 1993; World Bank Document, 2002). Moreover, the impact of infrastructure on economic development has been critically evaluated and validated empirically, especially as it relates to the interactions between private and public investment. (Aschauer, 1989a; Aschauer, 1989; Easterley and Ravelo, 1993; Pinnoi, 1994; Buffie, 1995 ; Barro, 1997; Looney, 1997; Canning, 1998 ; Rioja, 1999; Delorme et al., 1999 ; Sagales-Roca and Pereira, 2001; Voss, 2002; Otto and Voss, 1998). However, most literature on the impact of infrastructure on economic development, particularly the interface between public and private infrastructure, has mainly been concerned with developed economies (Pinnoi, 1994; Buffie, 1995 ; Wang, 2002) with very little attention paid to the developing world.

Lately, the new partnership for Africa's development (NEPAD) has recognized the vital role of infrastructures in economic growth and development; basically this is due to the present fragile economic base of sub-Saharan Africa and the obvious global strident shift towards effective consistence in infrastructure delivery (NEPAD, 2004). The fragile economic base of the region is notable for its frequent high inflation rates, heavy debt overhang, its monoculture economies, uncontrolled population growth and the wasteful expenditure profile of many sub-Saharan African countries. For example, over a third of the roads built in the sub-Saharan Africa are now obsolete (World Bank, 1994; Zawdie and Langford, 2001). Another example of waste is the Nigeria natural gas project, where the gas flaring annually amounts to about four billion cubic meters. This is equivalent to 60% of the total thermal-based power generation in the whole of sub-Saharan Africa. Nigeria is currently producing 2500 megawatts of electricity, which is just 30% of its installed capacity (World Bank Document, 2002).

Consequently, the majority of the population in countries within sub-Saharan Africa - specifically Nigeria – has little or no access to potable water, decent shelter and healthcare, decent education, electricity, assessable roads, sanitation and telecommunications. These predicaments are further exacerbated by the fact that most of the existing infrastructures and projects are misallocated and this has led to low percentage cost recovery and poor spin-off for social economic development (World Bank, 2000). These problems regarding infrastructure delivery have raised strong doubts about the investment priorities and appropriateness of present infrastructure projects (Ostrom et al., 1993; Ostrom, 1996; Ogu, 2000; Kessides, 1999). Thus, the need to identify and empirically rank unambiguously notable factors responsible for the frequent infrastructure failures and dearth is overwhelming as this will facilitates the formulation of key policies for effective infrastructure and service delivery.

To this end, an extensive literature search was carried out in this study in order to identify the causes of inadequate infrastructure delivery and subsequent failures. In addition, a questionnaire survey was carried out in order to validate and rank the factors identified. These factors include the lack of suitable managerial and technical skills (Wells, 1986; World Bank, 1994; Aniekwu, 1995; Alutu, 2000); lack of effective and supportive institutions (World Bank 1994; Ebohon et al., 2002; Ostrom et al., 1993; Ostrom, 1996); inconsistent social, political and economic policies (Alutu, 2000; Filani, 1993); corruption and the lack of transparency and accountability (World Bank, 1994; World Bank Document, 2002; Ostrom, 1993); misallocation of investments (Ostrom et al., 1993; Ostrom, 1996; Ogu, 2000; Kessides, 1999); high construction and equipment procurement cost (Betts and Ofori, 1994); and poor consideration for maintenance (Wells, 1986; Filani, 1993; Betts and Ofori, 1994; Ofori, 1994; World Bank, 1994; Aniekwu, 1995; Ostrom, 1996; Alutu, 2000; Ebohon et al., 2002; World Bank, 2002).

After ranking these variable factors successfully, the threshold value or demarcation point was finally established using the SIMO model.

2. METHODOLOGY

A structured interview with the aid of a questionnaire was employed using the stratified random sampling technique. The questionnaire method of data collection was chosen because it is cost effective and ensures anonymity. The six geopolitical zones in Nigeria constitute the first specified stratum; afterwards respondents were randomly selected from the second specified stratum which was the sector / organisation of respondents. To this end, the subdivisions for the first stratum are as follows: south-west zone; south-south zone; south-east zone; north-west zone; north-central zone; north-east zone to cover respondents from the public sector, private sector and non-governmental organisation and those not willing to respond. Please see Table 1 and Table 2 for questionnaires distribution and responses in the appendix.

Respondents were asked to rate the stability of infrastructure and service delivery in Nigeria and this was cross tabulated with geopolitical zones to ascertain the relative cross-section of views across the country (see Table 3 in appendix). Further, respondents were requested to identify and rank factors in order of importance from a list of 18 identified to be likely causes of infrastructure and service delivery failures (see Table 3.1). In addition, Table 3.2 comprises the frequencies of factors in their various ranking positions in the order of priority accorded by respondents. This order of priority in the horizontal direction is in a decreasing arithmetic pattern where the factor with the highest severity is ranked as 1. Thus, the number of times a factor is ranked under a particular position is represented as its frequency counts for that ranking position. Moreover, the index factor column in the table is relevant due to prioritization by respondents and the many cases of multiple occurrences of variable factors in different ranking positions.

The effects of multiple occurrence of a factor in different ranking positions i.e. "corruption" appearing in twelve different factor ranking positions cannot be accounted for by mere frequency counts of one ranking position independently of the others (see Table 3.2). For example, in ranked position number 1 (see Table 3.2), the highest frequency count for a particular variable factor was 142 and this factor reappeared in ranked position numbers: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13 with the following frequency counts of 63, 19, 13, 13, 9, 3, 6, 4, 4, 1, 3 respectively (see Table 3.2). Thus, ranking this factor solely with the highest frequency count magnitude of 142 without considering the effects of its frequency counts in other ranking positions absolutely negates the true severity of this variable factor.

However, to consider all frequency counts in all the ranking positions for a particular factor without due consideration for the preference of ranking or ranking positions accorded it by respondents negates the actual severity of this variable factor. As a way of tackling this notable problem or observation in this type of survey, a severity index in matrix order (SIMO) was developed and applied in this investigation using notable existing mathematical and statistical tools like 'index values', 'matrix' and 'midhinge'. After ranking effectively, the model further demarcates without prejudice the major or critical variable factors from the minor variable factors by defining a demarcation point termed the 'threshold value'. The processes are carefully explained in the subsequent section.

2.1. Severity Index in Matrix Order (SIMO):

The following are the steps employed in building the model:

- The factors were coded from 1 to 18 i.e. F(1), F(2), F(3),….,F(18) (see Table 3.1).
- Ranking positions are created in decreasing order of severity corresponding to the number of factors under consideration i.e. P1, P2, P3,...,P18 (see Table 3.2).
- The frequency counts of each factor are entered under the various ranking positions respondents have given them (see Table 3.2). Thus, it is expected that a particular factor could have frequency counts in multiple ranking positions.
- The column of index factors as shown in Table 3.2 is derived by each of the numbers or items in the inverse array of arithmetic numbers i.e. 18, 17, 16, 15, 14,…,1 multiplied by the inverse of 18 or (1/18).
- The severity of all factors is calculated by multiplying the matrix of frequency counts under the various ranking positions (i.e.18 X 18 matrix) by the column of index factors (i.e. 1X18 matrix) to give an the array of severity magnitudes in first matrix as shown in Table 3.3.
- The variable factors and their severity magnitudes as explained above are re-arranged in a decreasing order of severity i.e. p(1), p(2), p(3),….,p(18) (see second matrix in Table 3.3 and Table 3.4).
- The threshold value or demarcation point is the midhinge of Table 6 (see equation 7 to 10)

These processes could also be represented in a mathematical format (see equation (1))

$$F(j) = \sum_{i=1,j=1}^{i=n,j=n} \mu_{ij} \frac{\sigma_i}{n} \text{.....................................} (1)$$

Where: $\sigma_i = (n + 1) - i$

j is the variable factor under consideration: for j = 1,2,3,…,n-1, n
σ_i is the factor for ranked position of the variable factor under consideration: for i = 1, 2, 3,….., n-1, n

Thus:
σ_1: represent variable factor position 1; σ_2: represent variable factor position 2…, σ_n: represent n^{th} variable factor position.

$\frac{\sigma_i}{n}$ = Severity index factor, for i = 1, 2, 3,….., n

μ_{ij} = is the frequency of variable factor j under ranked variable factor position i. Thus, equation (1) becomes

$$f(1) = \mu_{11}\frac{\sigma_1}{n} + \mu_{12}\frac{\sigma_2}{n} + \mu_{13}\frac{\sigma_3}{n} + ---- + \mu_{1n}\frac{\sigma_n}{n} \text{............}(2a)$$
$$f(2) = \mu_{21}\frac{\sigma_1}{n} + \mu_{22}\frac{\sigma_2}{n} + \mu_{23}\frac{\sigma_3}{n} + ---- + \mu_{2n}\frac{\sigma_n}{n} \text{............}(2b)$$
$$f(3) = \mu_{31}\frac{\sigma_1}{n} + \mu_{22}\frac{\sigma_2}{n} + \mu_{33}\frac{\sigma_3}{n} + ---- + \mu_{3n}\frac{\sigma_n}{n} \text{............}(2c)$$
$$\vdots$$
$$f(n) = \mu_{n1}\frac{\sigma_1}{n} + \mu_{n2}\frac{\sigma_2}{n} + \mu_{n3}\frac{\sigma_3}{n} + ---- + \mu_{nn}\frac{\sigma_n}{n} \text{............}(3)$$

transfering from equations (2) to equations (3) gives :

$$\begin{bmatrix} \mathbf{f(1)} \\ \cdot \\ \cdot \\ \mathbf{f(n)} \end{bmatrix} = \begin{bmatrix} \boldsymbol{\mu_{11}} & \cdot & \cdot & \boldsymbol{\mu_{1n}} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \boldsymbol{\mu_{n1}} & \cdot & \cdot & \boldsymbol{\mu_{nn}} \end{bmatrix} \begin{bmatrix} \boldsymbol{\sigma_1 / n} \\ \cdot \\ \cdot \\ \boldsymbol{\sigma_n / n} \end{bmatrix} \text{................................}\mathbf{(SIMO)}$$

Actual variable ranking position matrix (AVARP)

$$= \begin{bmatrix} P(1) \\ \cdot \\ \cdot \\ P(n) \end{bmatrix} \text{............................}(4)$$

And :

$$\begin{bmatrix} P(1) \\ \cdot \\ \cdot \\ P(n) \end{bmatrix} = \begin{bmatrix} f(1) \\ \cdot \\ \cdot \\ f(n) \end{bmatrix} \text{............................}(5)$$

$\Leftrightarrow f(1) \geq f(2) \geq f(3) \geq .... \geq f(n)$

$$\text{Otherwise}: \begin{bmatrix} P(1) \\ . \\ . \\ P(n) \end{bmatrix} = \begin{bmatrix} f(1) \\ . \\ . \\ f(n) \end{bmatrix} \uparrow \text{.......................}(6)$$

where :

" $\uparrow$ " implies an ascending order of magnitude in $\begin{bmatrix} f(1) \\ . \\ . \\ f(n) \end{bmatrix}$

p(1) is the highest severity position

p(2) is 2^{nd} highest severity position

.

.

.

P(n) is the least severe position.

Stage 2 : Threshold value (Demacation point) :

$$\text{The Threshold value (Midhinge) in the matrix of equation (6)} = \left[\frac{h_1 + h_2}{2} \right] \text{......................}(7)$$

where:

h_1 is the corresponding value to D_1

h_2 is the corresponding value to D_3

$$D_1 = \frac{n+1}{4} \text{...}(8)$$

$$D_3 = \frac{3(n+1)}{4} \text{.......................................}(9)$$

n is the total number of observations or variable factors under consideration in equation (6)

D_1 and D_3 are specified observations within the matix of equation (6).

Rules for D_1 and D_3 :

1. If D_1 or D_3 is an integer, the numerical observation or item corresponding to the position of that integer in the matrix is chosen for either D_1 or D_3

2. If D_1 or D_3 is halfway between two integers, the average of the corresponding items or observations is chosen.

3. If D_1 or D_3 is not an interger or halfway between two intergers then the resulting value should be approximat

to the nearest interger
and the corresponding item or observation is chosen.

N.B: All the variable factors (elements) in the matrix of equation (6) above cannot be accounted for in policy formulation as most severe at the same time. In order to over come this problem, variable factor's magnitude greater than or equal to the threshold value are to be considered most severe.
See equation (10)

Thus : $\left|P(a)\right|_{a=1,2..}^{n}$ = Threshold value.............(10)

3. RESULTS

Table 3.1: Variable factors under consideration

Variables	Variable factor [*F(j)*]
The lack of supportive institutions	F(1)
Misallocation of investments	F(2)
Lack of effective competition	F(3)
Inadequate maintenance	F(4)
Inconsistent billing strategy	F(5)
Inadequate cost recovery strategy	F(6)
Lack of suitable technical and managerial skill	F(7)
Lack of financial and managerial autonomy	F(8)
Corruption	F(9)
Lack of transparency and accountability	F(10)
Poor wages and remunerations	F(11)
High construction and equipment procurement cost	F(12)
Weather and difficult environmental terrain	F(13)
Inconsistent political, social and economic policies	F(14)
Insufficient funding for infrastructure	F(15)
Hostile communal conflicts	F(16)
Too much pressure on existing infrastructure	F(17)
All of the above	F(18)

Table 3.2: Frequencies of ranked variable factor positions and index factor

Variable Factors F(j)	Frequencies of ranked variable factors position (μ_{ij})																		Index Factor $\sigma_i / 18$
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	
F(1)	36	19	15	10	14	15	11	14	10	7	8	10	1	6	2	1	4	1	1.00
F(2)	101	41	33	17	13	19	14	9	10	6	3	4	4	2	4	1	0	0	0.94
F(3)	3	6	16	12	14	12	8	10	6	10	8	5	10	4	3	1	2	0	0.89
F(4)	22	55	39	41	25	11	14	9	9	1	3	4	1	1	1	1	2	1	0.83
F(5)	0	5	9	16	20	18	9	5	9	9	13	7	9	1	2	0	1	0	0.78
F(6)	0	4	9	11	14	16	12	8	9	10	10	6	2	14	3	1	0	0	0.72
F(7)	3	9	11	18	9	17	22	23	16	12	10	4	4	2	2	3	1	0	0.67
F(8)	0	17	12	7	11	9	11	19	18	12	5	10	6	4	2	5	0	0	0.61
F(9)	142	63	19	13	13	9	3	6	4	4	1	0	3	0	0	0	0	0	0.56
F(10)	5	35	35	30	33	20	19	7	9	10	1	2	1	0	0	1	0	0	0.5
F(11)	0	5	10	11	21	20	10	7	7	11	11	2	4	1	2	1	1	0	0.44
F(12)	1	1	7	8	10	19	10	7	9	8	4	13	8	4	3	1	1	0	0.38
F(13)	3	1	13	7	12	7	9	12	6	5	1	3	7	8	9	7	2	2	0.33
F(14)	4	10	12	23	15	24	28	25	11	5	2	4	2	7	3	1	0	0	0.27
F(15)	6	19	33	27	21	14	20	11	15	8	6	4	5	2	6	2	0	0	0.22
F(16)	0	1	1	3	6	6	10	6	8	7	7	6	3	6	8	6	4	2	0.17
F(17)	1	5	11	19	10	6	6	10	3	7	8	4	2	1	4	8	4	3	0.11
F(18)	59	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0.06

Table 3.3: Array of severity magnitudes in a decreasing order

$$\begin{bmatrix} f(1)\\ f(2)\\ f(3)\\ f(4)\\ f(5)\\ f(6)\\ f(7)\\ f(8)\\ f(9)\\ f(10)\\ f(11)\\ f(12)\\ f(13)\\ f(14)\\ f(15)\\ f(16)\\ f(17)\\ f(18) \end{bmatrix} = \begin{bmatrix} 132.62\\ 236.06\\ 83.07\\ 194.38\\ 85.34\\ 78.25\\ 108.02\\ 92.92\\ 256.88\\ 162.83\\ 81.81\\ 67.66\\ 64.49\\ 120.60\\ 142.62\\ 42.97\\ 67.51\\ 63.71 \end{bmatrix} \text{ arranging in decreasing order gives } \begin{bmatrix} p(1)\\ p(2)\\ p(3)\\ p(4)\\ p(5)\\ p(6)\\ p(7)\\ p(8)\\ p(9)\\ p(10)\\ p(11)\\ p(12)\\ p(13)\\ p(14)\\ p(15)\\ p(16)\\ p(17)\\ p(18) \end{bmatrix} = \begin{bmatrix} f(9)\\ f(2)\\ f(4)\\ f(10)\\ f(15)\\ f(1)\\ f(14)\\ f(7)\\ f(8)\\ f(5)\\ f(3)\\ f(11)\\ f(6)\\ f(12)\\ f(17)\\ f(13)\\ f(18)\\ f(16) \end{bmatrix} = \begin{bmatrix} 256.88\\ 236.06\\ 194.38\\ 162.83\\ 142.62\\ 132.62\\ 120.60\\ 108.02\\ 92.92\\ 85.34\\ 83.07\\ 81.81\\ 78.25\\ 67.66\\ 67.51\\ 64.49\\ 63.71\\ 42.97 \end{bmatrix}$$

Table 3.4: Actual variable factors ranking positions

p(1)		f(9)= corruption
p(2)		f(2)=misallocation of investments
p(3)		f(4)=inadequate maintenance
p(4)		f(10)=lack of transparency and accountability
p(5)		f(15)= insufficient funding for infrastructure
p(6)		f(1)= Lack of supportive institutions
p(7)		f(14)=inconsistent political, social and economic policies
p(8)		f(7)=lack of suitable technical and managerial skill
→←		→......................***Threshold (demacation point)***......................←
p(9)	=	f(8)=lack of financial and managerial autonomy
p(10)		f(5)= inconsistent billing strategy
p(11)		f(3)=lack of effective competition
p(12)		f(11)=poor wages and remunerations
p(13)		f(6)= Inadequate cost recovery
p(14)		f(12)=high construction and equipment procurement cost
p(15)		f(17)=too much pressure on existing infrastructure
p(16)		f(13)=weather and difficult environmental terrain
p(17)		f(18)= all of the above
p(18)		f(16)=hostile communal conflicts

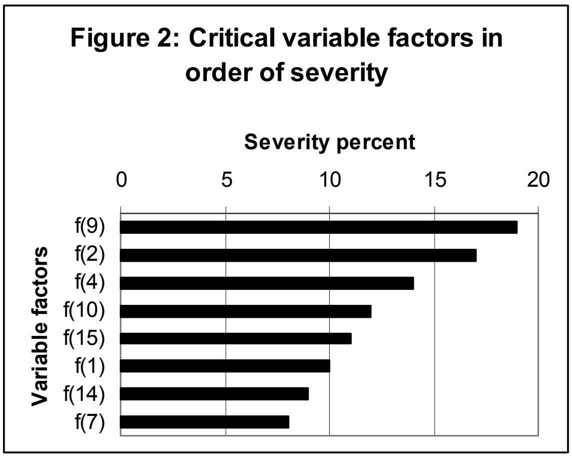
Thus : $D_1 = 5$; and $D_3 = 14$; $h_1 = 142.62$ and $h_2 = 67.66$

Thus : The "Threshold value" = 105.14

N.B. In applying equation (10) Variable factors in the matrix having severity magnitudes greater than or equal to the Threshold value are to be considered critical in policy formulation.

4. CONCLUSION

From the results received for Nigeria shown in Figure 1 after applying the threshold value, the following variable factors were identified as critical to the causes of infrastructure and service delivery failures in Nigeria: corruption [f(9)]; misallocation of investments [f(2)]; inadequate maintenance [f(4)]; lack of transparency and accountability [f(10)]; insufficient funding for infrastructure [f(15)]; lack of supportive institutions [f(1)]; inconsistent political, social and economic policies [f(14)]; lack of suitable technical and managerial skill [f(7)]. The proportion of severity of each of these factors is represented in Figure 2 below.



The Severity index in matrix order (SIMO) model developed in this investigation would empirically assist in the unambiguous ranking of notable variable factors in future investigation of this kind. Its application assisted the authors to identify effectively the core variable factors responsible for infrastructure and service delivery failures in Nigeria.

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APPENDIX:

Table1: Questionnaire distribution and responses within each Geopolitical zone

	Number of questionnaires	Number of respondents	Valid Percent	Cumulative Percent
No response	0	2.0	.5	.5
South west	100	59.0	14.6	15.1
North west	100	70.0	17.4	32.5
South east	100	61.0	15.1	47.6
North east	100	54.0	13.4	61.0
South south	100	99.0	24.6	85.6
North central	100	58.0	14.4	100.0
Total	600	403.0	100.0	

Table 2: Questionnaire distribution and responses within each Sector / organization

	Number of questionnaires	Number of respondents	Valid Percent	Cumulative Percent
no response	0	6.0	1.5	1.5
Public	210	133.0	33.0	34.5
Private	210	130.0	32.3	66.7
Non Governmental Organization	180	97.0	24.1	90.8
Not applicable	0	37.0	9.2	100.0
Total	600	403.0	100.0	

Table 3: Crosstabulation of Geopolitical region and Stability of Infrastructure in Nigeria

			Stability of Infrastructure and service delivery in Nigeria					Total
			No response	Very Stable	Stable	Unstable	Very Unstable	
Geo-Political Region in Nigeria	No response	Count	2	0	0	0	0	2
		% within Geo-Political Region in Nigeria	100.0%	.0%	.0%	.0%	.0%	100.0%
		% of Total	.5%	.0%	.0%	.0%	.0%	.5%
	South west	Count	1	4	3	20	31	59
		% within Geo-Political Region in Nigeria	1.7%	6.8%	5.1%	33.9%	52.5%	100.0%
		% of Total	.2%	1.0%	.7%	5.0%	7.7%	14.6%
	North west	Count	1	0	19	26	24	70
		% within Geo-Political Region in Nigeria	1.4%	.0%	27.1%	37.1%	34.3%	100.0%
		% of Total	.2%	.0%	4.7%	6.5%	6.0%	17.4%
	South east	Count	0	0	2	18	41	61
		% within Geo-Political Region in Nigeria	.0%	.0%	3.3%	29.5%	67.2%	100.0%
		% of Total	.0%	.0%	.5%	4.5%	10.2%	15.1%
	North east	Count	1	3	2	24	24	54
		% within Geo-Political Region in Nigeria	1.9%	5.6%	3.7%	44.4%	44.4%	100.0%
		% of Total	.2%	.7%	.5%	6.0%	6.0%	13.4%
	South south	Count	1	0	3	57	38	99
		% within Geo-Political Region in Nigeria	1.0%	.0%	3.0%	57.6%	38.4%	100.0%
		% of Total	.2%	.0%	.7%	14.1%	9.4%	24.6%
	North central	Count	0	0	5	25	28	58
		% within Geo-Political Region in Nigeria	.0%	.0%	8.6%	43.1%	48.3%	100.0%
		% of Total	.0%	.0%	1.2%	6.2%	6.9%	14.4%
Total		Count	6	7	34	170	186	403
		% within Geo-Political Region in Nigeria	1.5%	1.7%	8.4%	42.2%	46.2%	100.0%
		% of Total	1.5%	1.7%	8.4%	42.2%	46.2%	100.0%