PERFORMANCE OF SOME SELECTED CONSTRUCTION COMPANIES IN NIGERIA – SPSS ANALYSIS

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Reg. No. PGD/MCS/98/99/830

SUBMITTED TO

DEPARTMENT OF MATHS/COMPUTER SCIENCE
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGER STATE.

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF POST GRADUATE DIPLOMA IN COMPUTER SCIENCE

SEPTEMBER, 2000

CERTIFICATION

This is to certify that the research work and subsequent preparation for this project by Egwoh Yusuf Abdullahi registration No. PGD/MCS/98/99/830 was carried out under our supervision.

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DEDICATION

This work is dedicated to my wife (Hajia Maryam Abdullahi (Mrs.)) and my mother (Hajara Yusuf (Mrs.))

ACKNOWLEDGEMENT

This project is a reality, is a proof of Allah's interest and interference in the effort of men. Therefore my thanks goes to the Almighty Allah. It was His favour that saw me through.

I wish to acknowledge the contribution of my Supervisor Professor K. R. Adeboye who seriously help to shape my focus.

I will also like to acknowledge the contribution of the entire members of the staff of the department, my regard goes to Dr. Reju S. A. (HOD, Maths/Computer Science), Dr. Aiyesimi Yomi, Mr. Ezeakoh L. N. (Cordinator Post Graduate), Mr. Badmus, Mall. Audu, Mall. Hakimi and Kola for their contribution in one way or the other.

I hereby acknowledge with gratitude the roles of all the selected construction companies management and staff who have allowed me access to their archives. May Allah reward their labour of love.

The roles of my friends Mujtaba Faruk, Yahaya Audu, Mall. Suleiman Aliyu and my wife Hajiya Maryam Abdullahi (Mrs.) are invaluable.

My acknowledgement will not be complete if and only if I did not regard A. Maha (former registrar, Kaduna Polytechnic) who by the wish of Almighty Allah gave this golden opportunity to me. May the Almighty Allah remember you for good for what you did to ensure this modest achievement.

ABSTRACT

Nigeria is a country with large population. She has effectively mobilize this population for construction delivery in the past. In view of the job cut occasioned by the introduction of information technology (II) into the banking sector, this project sets to find out whether construction of many measures taken to ensure otherwise. These measures include the structural adjustment programme (SAP), the national goal on construction policy.

The study reviewed construction equipment as an input. It was emphasized in areas of sourcing, maintenance and managed. To observe the mix of inputs of plants and labout, the construction firms selected for the study were categorized into building, civil and building and civil firms. Costs to input on construction earning for the years selected were analysed.

At the end, it was found that labour influenced construction earning for six of the eight firms selected for the remaining two it did not. It was also discovered that the average percentage cost of equipment used for construction earning for the two indigenous firms selected are 0.94 and 0.81 percent. These were lowest. For their foreign counterparts, it was 2.6016 and 2.093. for civil firms it was 6.01 and 4.028. while for building firms it was 0.9323 and 0.4108. civil firms recorded the highest.

The percentage cost for labour was higher in all of the firms selected. They were 6.25 and 3.93 for the indigenous firms and 18.42 and 16.93 and for building they were 16.93 and 16.71.

A drop in the cost of equipment used was observed for four of the firms selected. This drop were notice from the late 1980s to 1995. The list used was in 1993-1994.

The project posited that the drop in the use of equipment was a response to the political and energy crises. This is because the drops, where they occurred started before the year 1991 when the construction policy on equipment was introduced.

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CHAPTER ONE

TOPIC: PERFORMANCE OF SOME SELECTED CONSTRUCTION COMPANIES IN NIGERIA –SPSS ANALYSIS

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

It is essential that the structure and services of the construction industry are periodically assessed against the economic and planning projections for necessary adjustments lock (1996). Said that such assessments may obviously be too late to be of benefit to the completed projects, but they can be helpful in pointing out mistakes to be avoided in the future. Such a study in the United Kingdom (U. K.) focused on the activities between 1960's and early 1980's revealed the dissatisfaction of the clients with the services of the construction industry (Raftry 1991). The resultant measures taken in view of these led to the emergence of other form of project procurements apart from the traditional system. These corrective options include package deals, design and build, project management and management contracting.

Apart from past events, appraisals, according to Molander and Winterton (1994) can also be used as a technique for reviewing current performance.

Therefore an appraisal in the Nigeria context, examining the structure of the construction industry, which Husseini (1991) said, has been playing a dominant role in the economic activities of the country since independence may reveal distortions. Also it is probably be at variance with projected growth, the roles and set goals of the construction industry. A focus can be streamlined to the country's internal participation and industry's inputs resources. Materials, labour, plant and equipment are the major input resources.

It is common knowledge that the indigenous firms' participation in project delivery in Nigeria is very low. Mohammed (1998) called it an in balance between indigenous and expatriates firms which stood at 90% in favour of the expatriates before the launching of the National policy on construction. These claims suggest that there has

been an improvement since then. With the improvement, Kontagora (1992) says that wholly owned Nigeria construction companies are only 5 % of the civil Engineering construction and 25% of the building. On the average multi-national construction firms owned 85% of the civil and building construction firms combined. In terms of the cost or volume of work done Olowo-Okere (1991) asserted that the multi-nationals account for 95% of the volume of construction contract in Nigeria. Therefore Ayida (1980) summarizes it all as, the foreign domination of the economy since the scenario is the same in other sector of the economy with little understandable improvement in some spheres. In all, it's glaring that the internal participation of Nigerian firms in construction delivery is very low.

On materials, Husseini (1991) was of the view that at some stages, over 80% of the construction materials are imported as finished products and even those supposed to have been manufactured locally have high foreign content. Aribisala's findings (1990) showed that the total import of building materials constructed about 5% of the countries total import bill. Therefore it can be said that the indigenous input to the nations construction material needs is very low; just a little better than her internal participation.

The trends above (of low internal participation) are worse with plant and equipment. Egbuna (1995) and Africa Review (1997)are unanimous that almost all of the needed plant and machinery are imported (perishable, non – mechanical and mechanical items alike). These come as a pre- owned or (fairly used), reconditioned and new equipment. And because of the oil wealth and lack of strict policy direction on them, partial automated construction machines have been crippling into the Nigeria construction workplace.

Studies affirm that the provision of labour in the only area of significance that the Nigeria nation can pride herself as regards active participation in the construction sector. According to Husseini (1991). Nigeria provides the bulk of the labour needed in construction ranging from unskilled to craft and the semi – skilled labour to skilled labour. Ayida (1980) confirmed that apart from the natural resources, that Nigeria's main assets are the human resources. That report affirms that the people of Nigeria may have demonstrated in many areas that they are dynamic, highly adaptable and

ready to absorb with speed the new skills, techniques and attitudes associated with modern and efficient economic management. On specific projects Nneib (1968), reported that Nigerians provided about 96% of the labour needed for the construction of the second main land bridge in Lagos. Bull (1977) reported a similar finding in the construction of the national theatre in Lagos.

It is noteworthy that many Nigerians find ready employment in the construction industry, which according to Husseini (1991) provides employment for close to one third of the counties total registered labour force in wage employment at a particular stage. This implies that Nigerians rely heavily on the construction sector for employment.

On one hand machine is an acknowledge threat to human labour. It is the closest substitute and therefore reduces the needed hands in any production process. Industrial sociologists refer to it as a substitution of technical capital for human capital. The mechanization of agriculture in advanced countries makes a relevant analogy. Clemmar and Mc Neil (1989) affirmed that less than 40 years ago, between one-quarter and one-third of the population in Europe were on the farm. Today no major nation except in Russia is the farming population greater than 10% of the whole. This percentage is shrinking to less than 4% in the U.S.A currently.

The British Broadcasting world news (1998) reported that Japan is undergoing the highest rate of unemployment of the individual companies selected after the Second World War. A possible explanation is the mechanization of the production process. For more than 10 years ago, Japan has been using robots with human support even in the areas of construction. And since their introduction, Kangari and Yashida (1989) said that robots are expected to play an increasingly important role in the production process in the 1990's. While machines reduces the over all numbers of semi-skilled operatives operating pant. These operators' task demand therefore becomes routine, and standardized giving little for creativity. Thurley (1991) argued that, that is an enormous wastage of human potentials since it has the tendency of de-skilling.

Machine therefore reduces creativity. The much cherished artistic human ingenuity on buildings and civil structures may fade proportionately to the degree of mechanization

adopted. In view of all these (effects of machine in labour) the Guardian (1998) said that the age long elementary theory that portrays human resources as the most important of all the factors of production may no longer hold water. Although Ataevetal (1995) still put the manual labour in any construction process to not less than 50%.

1.2 THE NEED FOR THE STUDY

The analysis of performance of construction companies in Nigeria is important especially for construction firms and the government. For construction firms (indigenous or foreign) going into or already in business in Nigeria, the study will give them the knowledge of the average trend of the cost of construction equipment needed or required for civil building works. For the government it will help to fine tune policy on equipment importation for the future.

Expect opinions are unanimous on the prime position of plant and equipment in construction business and project delivery. Day (1973) for instance postulated that the financial planning for an entire construction business often stems from the investment in equipment, since the total of this element constitutes the largest long-term capital investment in the business. Briscoe (1988) put it in another way, that a major portion of a company's earning is invested in equipment and plant, as it constitutes the largest capital outlay of any construction firm. One of the largest single factor construction cost is the investment in and operation of equipment (Robison; 1973). Therefore, Higgins (1978) suggested that a corresponding amount of management attention should be directed to protect the investment.

On management generally, Sozen (1979) opined that policy on equipment shows the priority developed by top management and it is an important guide to firms' priorities in resource allocation. Equipment is indeed central to construction business. Ogunsanwo (1983) posited that plants are necessary ingredients for the attainment and maintenance of high productivity. In terms of risk, plant and equipment seems to be more prone to risk to owners than any other construction input resources. When things go wrong in construction business an inbuilt mechanism discussed extensively by Raftery (199), provides the needed adjustment for copying with almost all other construction input resources except for plant and equipment. For example for Labour,

manning level is usually harmonized with construction output demands. Firms often make use of casual employment, overtime and its incentives, "finish – and – go", short time working with half pay, all as respone to variation in construction demand. Sub – contracting instead of direct Labour is a familiar feature thereby reducing the cost of administration of hired workers. The summary is that workers in construction are easily hired and fired except some key personnel who are retained even at critical times but probably on compulsory leave with half pay. Stretton (1979) confirmed this in Philippines, Manilla and San Juan. In these places a mechanism called right sizing is used.

As part of this inbuilt mechanism, is the monthly valuation that pays for work in progress and materials on site. Again the product itself is to a large extent assembled at the point of consumption (construction in – situ) there - by reducing the need of company premises. In all plant and equipment seems the endangered construction input with unprotected and yet as very sensitive instrument for construction projects delivery. Their acquisition and decision-making have gone beyond the Engineer's – rule - of thumb and other traditional and un-scientific approaches. Their management makes challenging intellectual demands on managers in areas of investment decision, competitive sources and their effects on other factors of production. Other tasks on managers including equipment maximization, productivity, economic stock of spare parts, energy conservation, impact on the environment (pollution), ease of operation and the operator's convenience obsolescence, recycling and disposal.

Such issues as these get compounded in Africa and other developing world for example African review (1997) said that equipping a work place is still major problem in Africa, because most of the machines have to be imported. Due to this weakness, developed nations dump all sorts of equipment in Africa (new, pre – owned and reconditioned). This undermines local efforts at production and self – sufficiency and increased dependence. In Nigeria, the unmonitored and unrestricted importation of part and equipment has compounded the problems of multinational dominance of the construction industry (Kontagora, 1992 and Omoniyi; 1994). This takes the form of heavy demand on the available foreign currency for profit repatriation, equipment purchase and maintenance.

While Aluko (1980) advocated a policy aimed at putting the nation's Human resources to the most productive use, the practice of huge importation of equipment may deprive Nigerians of the limited available jobs. In Ezekwe's opinion. (1996) the main cause of the failure of the national development plans and missions oriented strategies was the inordinate dependence on importation for the capital goods, plant and equipment, tools and spare parts used in production works and the provision of services. A statistical analysis (using SPSS) of performance of construction companies may reveal those areas requiring correction both at Micro and macro level. It may also prepare construction firms adequately for the cost of equipment needed for construction in Nigeria business environment.

1.3 OBJECTIVE

The objective of the research work include the following:

1. To determine the trends of equipment employment in construction delivery in Nigeria using the cost of equipment employed for contract earning
2. To use the trend above to determine whether or not construction is becoming equipment intensive.
3. To determine the trend in the use of labour to find out the effect of mechanism of construction on the significance of the labour employed in construction works.
4. To determine whether there is any association/relationship between the foreign construction companies and within the indigenous construction companies.
5. To estimate the multiple regression equation for each company that can predict any of the variables in the equation.

1.4 SCOPE

The study is limited to foreign firms, civil Engineering and building firms, Building only firms and indigenous construction firms. The value of equipment used or credited to specific contract earning of the years is used (whether owned or/and leased). It is limited to the period of the introduction of SAP, when various measure were introduced to make companies look inward and increase the Nigerian internal participation was introduced to date within this time frame, the National construction policy with the goal on construction equipment was also introduced.

It also considered all projects executed both private and public. The study is restricted to the limited liability, public and private companies. The study did not consider the sole proprietorship companies in the informal sector of the economy. In view of the importance of the group therefore the study is still opened to more intensive research.

Computer with its speed and accurate calculation of complicated task advantage, comes in to help in analysing the collected data using the statistical package for social science (SPSS) which is the appropriate package to analyse such time series data.

CHAPTER TWO

2.0 HISTORICAL BACKGROUND OF RELATED LITERATURE

2.1 LITERATURE REVIEW

Construction has to do with the physical development of a society. The construction industry is basically a service industry embracing building and civil works. The building sub – sector embraces institutional public residential and industrial building civil structures include roads, bridges, air and sea ports, dams water distribution systems, mining and refining structures maintenance, expansion, alterations and demolition of existing stocks of structures is also part of the construction industry. Activities in the construction industry mirror the general performance of any economy. This implies that a health economy usually experience an up swing in construction activities (Osemenam 1987).

The structures of the construction industry vary from country to country and it depends on three factors (Raftery; 1991), they are;

1. The type of work to be done,
2. The choice of technology
3. And the social and economic environment

The choice of technology, which is very relevant to this study, depends on the state of technological development of the country, the availability of resources (i.e. labour, material and capital) government policy and the overall development of the economy. The social and economic environment is a function of culture and historical development, the political and economic organisation of the country and the state of the economy.

The construction industry in Nigeria like in most societies started from the primary need for shelter. Initially it took the form of communal activities before the present commercial trend. While the command approach can still be found in rural settings, it has been over-shadowed in the town and cities by the commercial trend of things.

Because of the Nigerian colonials antecedents and existing ties, the construction industry in Nigeria has a strong British influence. Here consultants including

architects, engineers, surveyors and planners play leading roles. Other actors in the industry are clients (employers), the material manufacturers, the merchants and contractors.

The physical production activities of construction are directly carried out by the contractors. And like in most economies there are the formal construction firms (both small proprietorship and large firms) and the informal sector. The informal sector has firm of different categories. The informal sector comprises of individual trades usually for this household units. The activities and existence of this sector are difficult to quantity but generally for sometimes, the World Bank has shown interest in the development in this sector because of the large number of people involved in it, in every sector of the economy of the developing nations. It has the potential to become the basis for real development. But at the moment Olowo okere (1991) said that it is unorganized and does not operate under any set of rules or regulations.

The formal sector has its origin in the activities of colonial masters the pioneering multinational trading companies and the missionaries. Apart from the needed administrative building and warehouse, there were attempts at creating environmental incentives for foreign staff in Nigeria to accept posting to the colonies. While the construction activities of the colonial administrators and merchants were to exploit the wealth of the colonials, missionaries dwell on humanitarian activities building motherless babies homes, hospitals, churches and schools. The activities of craft men among the free salves were a pioneering role too to the present shape of the construction industry in Nigeria. They were the foremost indigenous elite's activities in the industry.

After independence, the economy policies to develop the different sector of the economy naturally stimulated construction activities. Apart from this, the government shared direct interest in developing the construction in Nigeria industry. For instance the construction in Nigeria editorial (1976) said that the third development plan (1973 – 1980) gave nearly to percent to building and construction industry. Before this time was the post civil war reconstruction programme. After the development plan, the political party in office among other construction programmes accorded priority position to housing provision. All along construction has enjoyed some boom

except the civil war break and the mid 1980's recession. As has been suggested earlier, the choice of technological for construction works depends on the state of technological development. It follows therefore that the use of equipment in Nigeria had a proportionately humble beginning following the technological development trend of the nation. It started with the traditional implement through the use of tools, non-mechanical to mechanical even automated plans.

Briscoe (1988) defined plant and equipment in the construction industry as every thing from perishable items through non - mechanical ones to mechanical items. Ogunsemi (1995) discussed plant and equipment under hand tools and general equipment. It has been observed that most firms will purchase smaller perishables as well as routine type of non-mechanical items mainly such regime power or fuels operators and probably servicing. They are easy to manage. The expected cash flow however, stimulates firms earning good profit or those that are large enough to secure bank loans for investment to acquire mechanical and automated equipment. Normally, firms should acquire enough plant to place them in a competitive position in their choosing line of operation. Of course, firms earn clients confidence by the fleet of equipment they parade. Companies supplement their stock of equipment by hiring and equipment leasing industry is fast growing in Nigeria.

According to Ogunsemi (1995) machines were introduced into construction works because:

1. Construction operations are carried out at a short time
2. Machines provide high quality products.
3. It reduces short of labour and saves man power

These day also automatic machines are used to perform high risk operation s like spraying dangerous chemicals on building components. With particular reference to Nigerian, Ogunsemi (1995) noticed that equipment enable the indigenous contractors to adequately compete with foreign firms in term of quality and speed.

Construction equipment are so diverse and put to different uses in various aspect of the construction process classification into simple categories or group is therefore difficult. There have been some attempts however. Some classified according to the most active functional component used for construction (functional operation). Other

according to the construction operation in which they most frequently workday (1973) argues that this latter classification is more appropriate because equipment selection are based primarily on the construction operation where they will be used. Specifically, an operation must be known before a good equipment selection for it can be made. Also the planer must have a mental picture of the operation and the key data for it to plan the methods and for the equipment needed. The disadvantage here, however, is the tendency to think of a place of equipment in relation to only one type of operation.

2.2 HYPOTHESIS

1. Null Hypothesis (HO)! The cost of equipment used did not influence the contract earnings of the various companies selected significantly more than the cost of labour at five (5%) percent level for the various years selected. Alternately hypothesis (HI)! The cost of equipment used influence the contract earnings of the various companies selected significantly than the cost of labour at five percent (5%) level of the various years selected.
2. Null Hypothesis (Ho)! There is no significant difference between the influence of equipment cost on contract earning for building and civil construction firms at five percent (5%) level for the various firms and years selected. Alternately Hypothesis (HI): there is significant difference between the influences of equipment cost on contract earning for building and civil construction firms at five percent (5%) level for the various firms and years selected.
3. Null Hypothesis (Ho): there is no significant difference in the influence of the cost equipment used on construction earning for foreign and indigenous firms for the various firms and years selected at five percent (5%) level. Alternatively Hypothesis (Hi): There is no significant in the influence of the cost of equipment used on construction earning for foreign and indigenous Firms for the various firms and years selected for five (5%) level. Alternately Hypothesis (Hi): there is significant difference in the influence of the cost of equipment used on construction earnings foreign and indigenous firms for the various firms and years selected at five percent (5%) level.
4. Null Hypothesis (Ho): there is no significant relationship in the trend of the cost of equipment employed and the amount of contract earning by individual construction firms for project delivery for the various years selected. Alternately Hypothesis (Hi):

there is a significant relationship in the trend of the cost of equipment employed and the amount of contract earning by the individual construction firms for project delivery for the various years selected.

2.3 STATISTICAL TOOLS

The statistical tools employments in this study are:

1. CHI – SQUARE TEST OF DISTRIBUTION

The chi – square (X2) distribution is a theoretical sampling distribution that allows one to:

a). Test the discrepancies between observation and expected frequencies.

b). Test for the goodness of fit and

c). To determine association between two or more distribution.

2. ANALSIS OF VARIANCE (ANOVA)

Analysis of variance can be used to test the null hypothesis that a number of samples all come from the population with the same mean. The test can be accomplished by using the differences between sample means to estimate the variance of the population and comparing this. Estimates with an estimated of the population variance that is based only on the difference between individual. If the samples all comes from population with the same mean, the differences between sample means will be relatively small.

The estimates of variance base on the difference between means of group are called "between groups variance" and the variance base only on differences between individuals is called "within group variance". The above two statistical tools can be derived through multiple regression analysis.

3. TREND ANALYSIS/MEASURAMENT

The term trend is sometimes referred to as secular trend. It is defined as the long term "general drift" of a series of data. The trend or long term average growth can be easily seen by drawing the line or curve through the data representing the phenomenon under study. Secular trend movement are attributable to factors such as population change, technical progress, consumer taste etc.

There are two main method of measuring trend i.e moving average method and least square method:

1. **MOVING AVERAGE METHOD**: - When a trend is to be measured or determined by the method of moving averages, the average value of a number of (Years or months, weeks) is obtained. The effect of fluctuation that pull the annual figures away from the general trend. When applying this method a period for moving average is selected such as three (3) yearly, five (5) moving average etc. The period of moving average is decided in the light of circle.

   If Y_t, t = 1, 2, 3,....., n are the series values the three (3) yearly moving average is calculated as follows

   $$\frac{Y_1 + Y_2 + Y_3}{3}, \quad \frac{Y_2 + Y_3 + Y_4}{3}, \quad \frac{Y_3 + Y_4 + Y_5}{3}, \ldots\ldots\ldots\ldots$$

CHAPTER THREE

3.0 METHODOLOGY OF DATA COLLECTION

3.1 Method of data collection

Before any statistical work can be done at all, figures must be collected. The collection of data is a very important aspect of statistics, since any mistakes, error or bias, which arise in collection of data, will affect any conclusion subsequently based on such figures.

Data may be expressly collected for specific purpose, such data are known as primary data. The collection of facts and figures relating to the population in the census provides primary data. The great advantage of such data is that exact information wanted is obtained.

Often, however, data collection for some purposes, frequently for administrative reasons may be used. Such data are known as secondary data. Secondary data must be used with great care; such data may not give the exact kind of information wanted and the data may not be in the most suitable form. Before any such material can be used with safety it will be necessary to know the source of the of the figures, how they were obtained, exact definitions and method of collection.

Always remember that a conclusion can never be better than the original figures on which it is based unless the original figures are collected properly, any subsequent analysis will be at best, a waste of time and even disastrous, since it may mislead with serious consequences.

Figures relating to choosen study can be obtained either from the whole population or from sample. Whichever approach is decided on, one or a combination of the following methods can be adopted.

i. **DIRECT OBSERVATION**

This method of data collection entails sending observer to record what actually happens while it is happening. Actual measurements or counting also come under the healing of observations. This method of data collection is "coined" the best , as it

reduces the chanc of in – correct data being recorded, unfortunately it cannot always be used generally n account of cost.

ii. **INTERVIEWING METHOD**

Various studies about human health and activities are carried out through this method of data collection. Here the enumerator or field worker asks personally for the required information. The question and answer may be written or oral. The enumerator(s) can be briefed so that they understand exactly what the question means, so that they can get the "the right" answers. A disadvantage of this method is that inaccurate or false data may be given to the enumerator. The reason may be :

(a) Forgetfulness

(b) Misunderstanding the question; or

(c) A deliberate intent to mislead.

iii) **ABSTRACT FORM PUBLISHED STATISTICS**

Any data an investigator collects himself are termed primary data, because he knows the conditions under which they were collected.

Data taken from other people's figures on the other hand are termed secondary data. Users of secondary data cannot have as thorough an understanding of the background as the original investigator. Obviously, the compilation of such data needs care, in view of the possibility of their being special futures concerning the earlier statistics, which are known to be computer for this season, only the wishing to use published statistics should consider the purpose for which they were originally compiled.

In many government publications, the statistics are compiled with the knowledge that they will be used in the production of secondary statistics. Such statistics are carefully anointed and explained so that user will not mislead, and secondary statistics may be prepared from them with reasonable confidence.

iv. **POSTAL QUESTIONNAIRE**

This is another method of data collection in which list of questions are sent by post, unless however, the respondent (the person who is required to answer the questions has an interest in answering it or is under legal compulsion to do so. The postal questionnaire method of data collection is generally unsatisfactory, producing few replies and those of biased nature.

Methodology is a significant and important section of a study, in the sense that the validity and reliability of the subject title is determined and conceived up till the stage of data analysis.

In addition the researcher explained how data were collected to achieve the stated objective of the subject study. In carrying out these objectives, it is necessary to state the method of data collection employed.

3.2 METHOD OF DATA COLLECTION EMPLOYED

In selecting a research study, one major problem to be solved is the kind/techniques of data collection to be used. The researcher has enumerated some major techniques/methods being employed by statistician in collection of numerical data. However, the following factors should assist in choosing appropriate method(s) of data collection, cost of data collection time nature of the study and convenience.

Base on these factors, the researcher will make use of secondary (data collection by the record officer of the selected construction companies in Nigeria). Therefore, the researcher obtained all numerical data to be used from one major source i.e. data on yearly construction earnings and inputs (total value of plant, value of plant used, cost of labour, number of labourers and profit) was obtained in its original form as released by record officer.

3.3 DATA PRESENTATON

YEARLY CONSTRUCTION EARNINGS AND INPUT TABLE

COMPANY - BF1

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	45794853.00	1193804.80	193780.48	51803090.20	5195	1875097.50
1996	228289.55	1261337.11	122681.41	390819.18	4544	3228518.37
1995	14259519.41	8644021.34	105845.22	1853487.91	4193	207456.53
1994	10764855.19	7678563.21	120515.03	1737994.16	4050	1463414.43
1993	28878552.27	1986161.55	231898.91	3258272.05	4055	3030658
1992	23052919.84	1689073.62	176034.22	2413691.14	4583	2233800.32
1991	26606972.70	2116100.00	176648.78	2813296.63	4445	2383432.14

1990	25176420.38	2189506.88	166884.88	2649318.88	4385	1530178.63
1989	25554273.70	2652772	133873.04	3272611.52	3412	1650773.70
1988	12648364.42	2345119.77	121738.37	2784831.63	2702	145856.28

Source: BF1 Record Officer

COMPANY – BF2

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	3606829.20	70097.56	5390.24	465146.34	454	78780.48
1996	1659182.93	56121.95	2292.68	214243.90	455	4458841.46
1995	1609235.29	54141.18	2211.76	193941.18	617	393552.94
1994	2434293.33	68493.33	2506.67	223213.33	859	432480.00
1993	6241227.27	194590.91	8545.45	535590.91	792	965227.27
1992	3965189.19	148918.92	1945.95	409459.46	1171	730594.60
1991	5460306.12	255000.00	5510.20	508367.34	1074	1121734.70
1990	5809375.00	31250.00	11000	575500.00	NA	130625.00
1989	6949347.83	544987.83	25048.26	1093478.26	NA	143249.78
1988	3670049.77	581484.65	32423.95	815937.67	NA	72386.74

Source: BF2 Record Officer

COMPANY-CF1

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	16133731.00	2646829.20	484524.39	4554853.60	1175	549243.90
1996	7616317.07	2148414.63	375524.39	1047109.76	1101	263926.83
1995	2857294.11	792176.47	57411.76	461682.35	944	286282.35
1994	2716293.33	897800	65066.67	572826.67	1750	156506.67
1993	8737363.64	2641590.91	118227.27	1842318.18	2658	635363.67
1992	7896000	2864918.92	82216.22	1165837.84	3368	547405.41
1991	5262613.98	4879059.34	26339.59	629591.84	2333	591428.57
1990	1846740.50	6009863.38	NA	218250	2196	717069.38
1989	5705652.17	10429625.65	281278.70	NA	2086	1612608.70
1988	5992093.03	11476631.16	472603.49	NA	996	1379090.91
1987	5639285.71	12599181.19	714849.76	NA	2422	1334285.71
19986	19170000	41224471.54	NA	NA	2731	4484615.39

Source: CF1 Record Officer

COMPANY-CF2

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	50521134.15	5131760.96	68827.00	297780.49	1273	117963.41
1996	558256.10	478853.88	37426.00	159146.34	338	13634.15
1995	675670.59	353805.79	37548.49	98529.41	224	54764.71
1994	937320.00	406453.91	54683.49	141920.00	503	19026.67
1993	4701772.73	1481402.59	165347.86	633168.82	903	357136.36
1992	5424918.92	161928.49	183913.46	408756.76	1003	367135.14
1991	8217857.14	2395103.37	NA	NA	951	534489.78
1990	8863012.63	3527027.50	682360.13	536250.00	1012	470367.62
1989	9169721.74	6500283.48	NA	96347826.00	NA	179473.70
1988	8635742.33	5173385.35	182104.19	1063720.93	1056	91951.16
1987	7598128.33	5044983.81	NA	1094761.91	1228	96504.76

Source: CF2 Record Officer

COMPANY-BCF1

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	95740109.00	11539073.00	1367865.80	34465817.00	18057	3044560.90
1996	68902560.98	8887292.68	966036.59	16203146.34	15290	2505475.61
1995	4895564.71	6974505.88	651305.88	10119376.47	13592	1862447.06
1994	241960918.40	50303877.55	5221938.78	27726632.65	28413	7272346.94
1993	164759625.00	53278625.00	7559625.00	17481000.00	21290	5743250.00
1992	177961304.30	66806739.13	12093695.65	18210217.39	13398	68269556.52
1991	NA	NA	NA	NA	NA	NA
1990	NA	NA	NA	NA	NA	NA
1989	108665384.60	40713076.92	4548461.00	20646153.85	6224	3703076.92
1988	8759400	40588000	2804000	15538000	5367	3840000

Source: BCF1 Record Officer

COMPANY BCF2

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	20493768.00	760195.12	165902.43	1452853.60	1263	132548.78
1996	13734487.80	1022963.42	116658.54	1873573.17	1869	931512.20

1995	7145458.82	1619952.94	172658.82	464647.06	1703	540223.53
1994	6052906.67	1176013.33	139973.33	301626.67	1263	346200.00
1993	13503022.00	2848863.64	388636.36	829454.55	1980	856500.00
1992	20640108.11	3208108.11	374378.38	918270.27	3536	768054.05
1991	18829183.67	2218979.59	245714.29	1340510.20	595	1092857.14
1990	10710625.00	1518250.00	179375.00	1749375.00	418	735750.00
1989	9169721.74	6500283.48	NA	963478.26	NA	179473.70
1988	NA	NA	NA	NA	NA	NA
1987	NA	NA	NA	NA	NA	NA
1986	517044434.00	14845067.00	1444695.00	NA	NA	

Source: BCF2 Record Officer

COMPANY BCI1

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	NA	NA	NA	NA	NA	NA
1996	620000.00	50111.27	7941.39	41483.41	148180.00	71939.16
1995	452929.69	33048.35	4166.73	20016.47	148130.00	42471.88
1994	401394.93	32026.80	3180.27	14725.35	128110.00	37988.80
1993	1242712.40	86183.68	13892.55	43652.36	10959.00	39956.40
1992	873577.83	54405.14	8900.00	37734.05	10864.00	26817.08
1991	800011.83	75582.45	1021980.00	19398.37	9869.00	20004.18
1990	680775.25	32553.75	4505.75	18133.88	8830.00	49605.00
1989	713361.30	22814.13	3187.39	26047.83	6825.00	22743.48
1988	NA	NA	NA	NA	NA	NA
1987	NA	NA	NA	NA	NA	NA

Source: BCI1 Record Officer

COMPANY BCI2

Period of year	Contract earning	Total value of plant	Value of plant used	Cost of labour	No of labourers	Profit
1997	1607929.45	82768.37	10574.90	42625.11	148180.00	105600.28
1996	1720415.07	827680.37	11006.66	26025.52	113.00	103335.43
1995	10647777.25	79847.13	11029.95	21018.82	145.00	49862.55
1994	1276226.25	283198.88	357.50	52438.50	483.00	85222.62
1993	1139217.39	492519.78	1113.04	69853.04	NA	27307.39
1992	655743.72	526904.88	7410.69	90388.37	NA	4953.95

1991	599223.33	539426.43	7587.14	103628.33	NA	7751.19
1990	713361.30	22814.13	3187.39	26047.83	6825.03	22743.48
1989	NA	NA	NA	NA	NA	NA

Source: BCI 2 Record Officer

YEARLY CONSTRUCTION EARNINGS AND INPUTS IN PERCENTAGE

COMPANY – BCI1

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1997	NA	NA	NA	NA
1998	620000.00	1.28	6.69	11.60
1997	452929.69	0.92	4.42	9.34
1996	401394.93	0.79	3.66	9.46
1995	1242712.40	1.12	3.51	3.22
1994	873577.83	1.02	4.32	3.07
1993	800011.83	1.28	2.43	2.50
1992	680775.25	0.66	2.66	7.29
1991	713361.30	0.45	3.65	3.19
1990	NA	NA	NA	NA
1989	NA	NA	NA	NA
1988	NA	NA	NA	NA
	AVERAGE	0.94	3.93	

COMPANY – BCI2

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1997	1607929.45	0.66	2.65.	6.57
1996	1720415.07	0.64	1.51	6.01
1995	1064777.25	1.04	1.97	4.68
1994	1276226.25	0.03	4.11	6.68'

1993	1139217.39	0.10	6.13	2.40
1992	655743.72	1.13	13.78	0.76
1991	599223.33	1.27	17.29	1.29
1990	713361.30			
1989	NA	NA	NA	NA

COMPANY – BF1

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1998	45794853.00	0.42	11.31	4.09
1997	228289.55	0.54	17.2	14.14
1996	14259519.41	0.74	13.0	14.52
1995	10764855.19	1.12	16.15	13.59
1994	28878552.27	0.80	11.28	10.49
1993	23052919.84	0.76	10.42	9.49
1992	26606972.70	0.66	10.57	8.96
1991	25176420.38	0.66	10.52	6.08
1990	25554273.70	0.52	12.81	6.46.
1989	12648364.42	0.96	22.07	1.32
1988	10611649.29	1.41	25.07	1.07
	AVERAGE	0.93	16.93	

COMPANY – BF2

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1997	3606829.20	0.15	12.90	2.18
1996	1659182.93	0.14	12.01	26.87
1995	1609235.29	0.14	12.05	24.46
1994	2434293.33	0.10	9.17	17.77
1993	6241227.27	0.14	8.58	15.47
1992	3965189.19	0.05	10.33	18.43
1991	5660306.12	0.10	9.13	20.54

1990	5809375.00	0.19	9.91	2.25
1989	6949347.83	0.36	15.73	2.06
1988	3670049.77	0.88	22.23	1.97
	AVERAGE	0.41083	16.71	

COMPANY – CF1

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1997	16133731.00	3.00	28.23	3.40
1998	7616317.07	4.93	13.75	3.47
1997	2857294.11	2.01	12.65	10.02
1996	2716293.33	2.40	21.09	5.76
1995	8737363.64	1.35	21.00	7.27
1994	7896000.00	1.041	14.76	6.93
1993	5262613.98	0.50	11.96	11.24
1992	1846740.50	NA	11.82	38.83
1991	5705652.17	4.93	NA	28.26
1990	5992093.03	7.89	NA	23.02
1989	5639285.71	12.68	NA	23.33
1988	19170000.00	NA	NA	23.39
	AVERAGE	4.078	16.92	

COMPANY – CF2

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1998	50521134.15	13.62	5.87	2.34
1997	558256.10	6.70	28.51	2.44
1996	675670.59	5.56	14.58	8.11
1995	937320.00	5.83	15.14	2.03
1994	4701772.73	3.52	13.47	7.60
1993	5424918.92	3.39	7.54	6.77

1992	8217857.14	NA	NA	6.50
1991	8863012.63	7.70	6.05	5.31
1990	9169721.74	NA	10.51	1.96
1989	8635742.33	2.11	12.32	1.07
1988	7598128.33	NA	14.14	0.94
	AVERAGE			

COMPANY – BCF1

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1997	95740109.00	1.43	36.00	3.64
1996	68902560.98	1.40	23.52	3.64
1995	4895564.71	1.33	20.67	3.80
1994	41512453.33	1.16	23.20	3.70
1993	148410272.70	1.29	17.65	3.81
1992	174852486.50	1.08	12.60	3.54
1991	241960918.40	2.16	11.46	3.01
1990	164759625.00	4.59	10.61	3.09
1989	177961304.30	6.79	10.23	3.84
1988	NA	NA	NA	NA
1987	NA	NA	NA	NA
1986	108665384.60	4.19	19.0	3.41
1985	8759400	3.20	17.74	4.39
	AVERAGE	2.60	18.42	

COMPANY – BCF2

Period in years	Contract earning ($)	Plant used (%)	Labour used (%)	Profit (%)
1997	20493768.00	0.81	7.09	
1998	13734487.80	0.85	13.64	
1997	7145458.82	2.42	6.50	

1996	6052906.67	2.31	4.98	
1995	13503022.00	2.88	6.14	
1994	20640108.11	1.81	4.45	
1993	18829183.64	1.31	7.12	
1992	10110625.00	1.68	16.33	
1991	9169721.74	NA	NA	
1990	NA	NA	NA	
1989	NA	NA	NA	
1988	51704434.00	2.79	NA	
1987	32910926.00	3.99	NA	
	AVERAGE	2.10	8.25	

CHAPTER FOUR

4.0 ANALYSIS OF DATA USING STATISTICAL PACKAGE FOR SOCIAL SCIENCE (SPSS)

4.1 SPSS COMMAND/INSTRUCTION FOR THE ABOVE STATISTIC TOOLS

JULIUS BERGER (BCF1)

Data list free /A B C D E F

Variable labels A "Contract earning"
B "value of plant"
C "Value of plant used"
D "Labour cost"
E "No. of labour"
F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996" 9 "1997"

Begin date

177961304.30	99806739.13	12093695.65	18210217.39	13398	6826956.52
164759625	52378625.00	7559625	17481000	21290	57432.50
241960918.40	50303877.55	5221938.78	27726632.65	28413	7272346.94
174852486.50	26696594.59	1891729.73	22023027.03	23782	6193513.51
148410272.70	23976954.55	1919363.64	26198409.09	19202	6560681.82
41512453.33	6822906.67	482626.67	9629173.33	14579	1534186.67
48955564.71	6924505.88	651305.88	10119376.47	13592	1862447.06
68902560.98	8887292.68	966036.59	16203146.34	15290	2505475.61
95740109	1159073	1367865.80	34465817	18057	3044560.90

End data.

Regression var. = A B C D E F
/dependent = A
/method = stepwise.

ARCICO PLC (BF2)

Data list free /A B C D E F

Variable labels A "Contract earning"
B "value of plant"
C "Value of plant used"
D "Labour cost"
E "No. of labour"
F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996" 9 "1997"

Begin date

5460306.12	255000	5510.20	508367.34	1074	1121734.70
3965189.19	148918.92	1945.95	409459.46	1171	730594.60
6241227.27	194590.91	8545.45	535590.91	792	965227.27
24342993.33	68493.33	2506.67	223213.33	859	432480.00
1609235.29	54141.18	2211.76	193941.18	617	393552.94
1659182.93	56121.95	2292.68	214243.90	455	445841.46
3606829.20	70097.56	5390.24	465146.34	454	78780.48

End data.

Regression var. = A B C D E F

/dependent = A

/method = stepwise.

DUMEZ NIG. LTD. (CF1)

Data list free /A B C D E F

Variable labels A "Contract earning"
B "value of plant"
C "Value of plant used"
D "Labour cost"
E "No. of labour"
F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996" 9 "1997"

Begin date

5262613.98	4879059.34	26339.59	627591.84	2333	591428.57
7896000	2864918.92	82216.22	1165837.84	3368	547405.41
8737363.64	2641590.91	118227.27	1842318.18	2658	635363.64
2716293.33	8978000.00	65066.67	572826.67	1750	156506.67
2857294.11	792176.47	57411.76	461682.35	944	286282.35
7616317.07	2148414.63	375524.39	1047109.76	1101	263926.83
16133731.00	2646829.20	484524.39	4554853.60	1175	549243.90

End data.

Regression var. = A, B, C, D, E, F.

/dependent = A

/method = B, C, D, E, F.

CAPPA (BF1)

Data list free /A B C D E F

Variable labels A "Contract earning"

B "value of plant"

C "Value of plant used"

D "Labour cost"

E "No. of labour"

F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996" 9 "1997"

Begin date

12648364.42	2345119.77	2784831.63	121738.37	2702	145856.28
25554273.70	2652772.61	3272611.52	133873.04	3412	1650773.70
25176420.38	2189506.88	2649318.88	166884.88	4385	1530178.63
2660697.27	2113100.00	2813296.63	176648.78	4445	2383432.14
23052919.84	1689073.62	2413691.14	196034.22	4583	2233800.32
28878552.27	1986161.55	3258272.05	231898.91	4055	3030658
10764855.19	768563.21	1737994.16	120515.03	4050	1463414.43
14259519.41	864021.34	1853487.91	105845.22	4193	2070456.53
22828934.55	1261337.11	3908019.18	122681.41	4544	3228518.37
45794853.00	1193804.80	5180390.20	193780.48	5195	1875097.50

End data.

Regression var. = A, B, C, D, E, F.

/dependent = A

/method = B, C, D, E, F.

NNCC (BCI2)

Data list free /A B C D E F

Variable labels A "Contract earning"

B "value of plant"

C "Value of plant used"

D "Labour cost"

E "No. of labour"

F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996" 9 "1997"

Begin date

599223.53	539426.43	7587.14	103628.33	7751.19
655743.72	526904.88	7410.69	90388.37	4953.95
1139217.39	492519.78	1113.04	69853.04	27307.39
1276226.25	283198.88	357.5	52438.5	85222.62
857219.69	232641.94		45696.73	43952.14
1064777.25	79847.13	11029.95	21018.82	49862.55
1720415.07	82768.37	11006.66	26025.52	103335.43
1607929.45	82768.37	10574.90	42625.11	105600.28

End data.

Regression var. = A, B, C, D, E, F.

/dependent = A

/method = B, C, D, E, F.

GODA NIG. LTD. (BCI1)

Data list free /A B C D E F

Variable labels A "Contract earning"

B "value of plant"

C "Value of plant used"

D "Labour cost"

E "No. of labour"

F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996"

Begin date

713361.30	22814.13	3187.39	26047.83	6825	22743.48
680775.25	32553.75	4505.75	18133.88	8830	49605
800011.83	75586.45	10219.80	19398.37	9869	20004.18
873577.83	54405.14	8900.00	37734.05	10864	26817.08
1242712.40	86183.68	13892.55	43652.36	10989	39956.40
401394.93	32026.80	3180.27	14725.35	128110	37988.80
452929.69	33048.35	4166.73	20016.47	148130	42471.88
620000.00	50111.21	7941.39	41483.41	148180	71739.16

End data.

Regression var. = A, B, C, D, E, F.

/dependent = A

/method = B, C, D, E, F.

ROADS NIG. LTD. (CF2)

Data list free /A B C D E F

Variable labels A "Contract earning"

B "value of plant"

C "Value of plant used"

D "Labour cost"

E "No. of labour"

F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"
7 "1995" 8 "1996"

Begin date

8863012.63	3527027.50	682360.13	5362.50	1012	470367.62
5424918.92	1616928.49	183913.46	408756.76	1003	367135.14
4701772.73	1481402.59	165347.86	633168.82	903	357136.36
937320.00	406453.91	54683.49	141920.00	503	19026.67

675670.59	353805.79	37548.49	98529.41	224	54764.71
558256.10	478853.88	37426.00	159146.34	338	13634.15
5052134.15	5131760.96	6882.78	297780.49	1273	117963.41

End data.

Regression var. = A, B, C, D, E, F.

/dependent = A

/method = B, C, D, E, F.

COSTAIN WEST AFRICAN PLC (BCF2)

Data list free /A B C D E F

Variable labels A "Contract earning"

B "value of plant"

C "Value of plant used"

D "Labour cost"

E "No. of labour"

F "Profit"

Value labels 1 "1989" 2 "1990" 3 "1991" 4 "1992" 5 "1993" 6 "1994"

7 "1995" 8 "1996"

Begin date

10710625.00	1518250.00	179375.00	1749375.00	418	735750.00
18829183.67	2218979.59	245714.29	1340510.20	595	1092857.14
20640108.11	3208108.11	374378.38	918270.27	3536	768054.05
135030.22	2848863.64	388636.36	829454.55	1980	856500.00
6052906.67	1176013.33	139973.33	301626.67	1263	346200.00
7145458.82	1619952.94	172658.82	464647.06	1703	540223.53
13734487.80	1022963.42	116658.54	1873573.17	1869	931512.20
20493768.00	760195.12	165902.43	1452853.60	1263	132548.78

End data.

Regression var. = A, B, C, D, E, F.

/dependent = A

/method = B, C, D, E, F.

4. CORRELATION AND REGRESSION

Using the data presented above spss analysis and graph of moving average of the data will be made use of in the project analysis. Specific observation will be noted in the course of the analysis. After the analysis a general observation will be made.

TEST FOR HYPOTHESIS

1. Null Hypothesis (H_o)! The cost of equipment used did not influence the contract earnings of the various companies selected significantly more than the cost of labour at five (5%) percent level for the various years selected.

   Alternately hypothesis (H_1)! The cost of equipment used influence the contract earnings of the various companies selected significantly than the cost of labour at five percent (5%) level of the various years selected.

2. Null Hypothesis (H_o)! There is no significant difference between the influence of equipment cost on contract earning for building and civil construction firms at five percent (5%) level for the various firms and years selected

   Alternately Hypothesis (H_1): there is significant difference between the influences of equipment cost on contract earning for building and civil construction firms at five percent (5%) level for the various firms and years selected.

3. Null Hypothesis (H_o): there is no significant difference in the influence of the cost equipment used on used on construction earning for foreign and indigenous firms for the various firms and years selected at five percent (5%) level.

   Alternatively Hypothesis (H_1): There is no significant in the influence of the cost of equipment used on construction earning for foreign and indigenous Firms for the various firms and years selected for five (5%) level.

   Alternately Hypothesis (H_1): there is significant difference in the influence of the cost of equipment used on construction earnings foreign and indigenous firms for the various firms and years selected at five percent (5%) level.

4. Null Hypothesis (H_o): there is no significant relationship in the trend of the cost of equipment employed and the amount of contract earning by individual construction firms for project delivery for the various years selected.

   Alternately Hypothesis (H_1): there is a significant relationship in the trend of the cost of equipment employed and the amount of contract earning by the individual construction firms for project delivery for the various years selected.

For the test, the closer the significant T for the various variables to 0.05 the more their influence on the dependent variable (contract earnings). See appendix A to I for details

For the regression equation ($y = a + bX$)

y = dependent variable (contract earnings)

a = constant

b = the gradient

X = the independent variable(cost of plant used)

Also for the multiple regression equations:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$b_1 X_1$ = for the value pf plant in the yard

$b_2 X_2$ = for the value of equipment used

$b_3 X_3$ = for the cost of labour used

$b_4 X_4$ = for the number of labour employed

$b_5 X_5$ = for the profit accrue from contract earrings.

Hypothesis test for BCI1, construction firm.

The detail regression analysis abstracted for the value of plant used from the multiple regression is as shown below.

(multiple regression)

Multi – R	R square	Adjusted R	B	Value Sign To 0.95	Constant
0.97593	0.95244	0.83353	11.39981	0.7412	584079.73494

(Stepwise method)

Multi – R	R Square	Adjusted R	B	Value sig T 0.95	Constant
0.85720	0.73478	0.69058	58.20499	0.0065	31570462690

The multiple regressions analysis for the firm shows that the data analyzed are correlated (positively) (multi–R=0.97593). These data explain the regression equation up to 85.721 percent. Other variable not in this data account for up to 14.28 percent.

Null hypothesis (Ho): the cost of equipment used did not influence the contract earnings of the various companies selected significantly more than cost of labour at five percent (5%) level for the various years selected is not justify. Since the sig T 0.95 value < sig T 0.95 value i.e. (0.7412 < 0.9666). Therefore, there is an indication that the cost of equipment used influence the contract earnings of the various companies selected significantly than the cost of labour at five percent level.

Further analysis using stepwise method confirms that the cost of plant used influenced more than other variable for this company. Therefore the alternative hypothesis is accepted. For the regression equation for the value of plant used.

a = 584079.73494

b = -11.39981

then the regression equation; $y = a + bX$ is

$y = 584079.73494 - 11.39981X$

Therefore for any contract sum y, the value of plant needed this company x can be estimated.

For the general equation $Y = a + b_1X_1 + b_2X_2 + b_3X_3$ .....

$b_1 = 111.76491$, $b_2 = -11.39981$, $b_3 = 0.772925$, $b_4 = -1.51575$, $b_5 = -0.62043$.

$y = 584079.73494 + 111.7691X_1$ 1-11.39981 $X_2 + 0.77295X_3$

$-1.51575X_4 - 0.62043X_5$.

For any contract value, if the value of plant in the company's yard is estimated and the number of labourer and their cost estimate, after an allowance for the mark up, the cost of the plant needed for the job can be estimated also from the general equation above.

The analysis of variance also justify the conclusion above because it indicate that for all the variable in the equation perform differently in terms of influencing the development variable (contract earning).

BCI2 construction firm

Multiple regressions

Multi –R	R-square	Adjusted -R	B	SigT 0.95 value	Constant
0.98191	0.96415	0.89244	38.57773	0.3013	-4514.03514

the sigT0.95 cost = 0.1929

$b_1 = 3.51605$, $b_2 = 14.34416$, $b_3 = 38.57773$, $b_4 = 16.37139$

The multiple –R shows that the data analysis are corrected (positively) – multi R =0.98191).

These data explains the regression equation up to 96.415 percent. Other variable not in the data account for 3.585 percent.

The sigT0.95 plant =0.3013 and sigT0.95 labour =0.1929. therefore we accept the Null hypothesis that the cost of plant used by this company did not influence the contract earnings more than the cost of labour used at 5 percent level.

For the general regression equation.

$Y = a + b_1X_1 + b_2X_2 + b_3X_3$ .....

$y = -4514.03514 + 3.51605X_1 + 14.34416X_2 + 38.57773\ X_3 - 16.37139X_4$

Similarly the value of plant needed can be estimated from the mark up allowed up allowed for by this firm.

The analysis of variable in this company indicate that there is no two variable in this company indicate that there is no two variance perform equally in term of influencing the dependent variable (contract earning).

Hypothesis Test for BCF1 Construction Company.

Multiple regression analysis

Multi –R	R – square	Adjusted –R	B	SigT value	Constant
0.99649	0.99298	0.98129	0.04843	0.9884	-55972631.64

SigT 0.95 cost is 0.6653

The result of the multiple regression analysis for this firm shows that the data analysis are correlated (positively – Multi – R=0.99649). it also shows that, these data explain the regression equation up to99.3 percent. Other influence on the contract for only 0.7 percent.

The sig T 0.95 value > sig T 0.95 cost(0.9884 > 0.6653). for plant and labour cost respectively.

Therefore we accept the null hypothesis that the cost of plant used did not influence the contract earnings for this firm, more than the cost of labour expended at five percent (5%). Level for the various years selected.

For the general regression equation for all the variables;

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$.....

$b_1 = 2.20018$, $b_2 = 0.04843$; $b_3 = 0.37820$; $b_4 = 4375.02308$; $b_5 = 18.7601$

$y = -55972631.64 + 2.20018X_1 + 0.04843X_2 + 0.37820X_3 + 4375.02308X_4 + 18.76013X_5$

Also with the value of the plant in the yard, labour cost and mark up the value of plant needed can be estimated from the general equation above.

Hypothesis test for BCF2

Multiple regression analysis

Multi – R	R –square	Adjusted – R	B	SigTvalue	Constant
0.79675	0.63480	-0.27819	-1.28093	0.9420	-204457.0267

Sig –T 0.95 cost is 0.3492

The multiple regression analysis for the data of company shows that the data are correlated (positively multiple –R=0.79675). these variable explains the dependent variable (contract earning)up to 63.48 percent. So other variables explains the contract earnings up to 36. 52 percent which are not in the used variables.

The sig T0.95 value > sig T 0.95 cost (0.9420>0.3492).

Therefore we accept the Null hypothesis that the cost of plant used for project delivery did not influence the contract earning for this firm than the cost of labour expended at 5% level for the various years selected.

For the general equation for all the variables;

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + ...$

$b_1 = 27.59591$, $b_2 = 1.28093$, $b_3 = 8.07397$, $b_4 = 952.177743$, $b_5 = -7.21808$.

$y = -204457.026 + 27.59591X_1 + 1.28093X_2 + 8.07397X_3 + 952.17743X_4 - 7.21808X_5$.

From the general equation if the value of the plant in the yards are estimated and the number of labourer with the cost and company mark up then the value of plant needs can be established.

The analysis of variance shows that the variable in the equation are nearly perform equally in terms of influencing the dependent variable (contract earning). Since f=sigF (0.69530 and 0.6789) respectively.

Hypothesis test for CF1 construction firm

Multiple regression analysis

Multi – R	R –Square	Adjusted –R	B	Sig Tvalue	Constant
0.99913	0.99827	0.98959	-0.08584	0.8002	-129068.744

Sig T0.95 cost is 0.1505

The multiple regression analysis for the data of this company show that the data are perfect correlated (multiple – R=0.9913). The variable in the equation explain the dependent variable (contract earning) up to 99.827 percent. Approximately 100 percent. So, there is no other variables that can be include as an independent variable in the this company that can influence the dependent variable.

The sigT 0.95 value >sig T 0.95 cost (0.8002 > 0.1505)

Therefore we accept the null hypothesis that the cost of plant used by this company did not influence the contract earning more than the cost of labour used at 5 percent level. For the general equation;

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots\ldots$

where b_1 =13.31024, b_2 = -0.08584, b_3 =1.47726, b_4 =893.41803, b_5 =6.11059

$y = -1290068.744 + 13.31024X_1 - 0.08584X_2 + 1.47726X_3 + 893.41803X_4 + 6.11059X_5$

For any contract sum with the value of plant in the yard estimated, the cost of labour from the labourer and the company's mark up the cost of plant can be estimated.

Hypothesis test for CF2 construction firm

Multiple regression

Multi – R	R –Square	Adjusted –R	B	Sig T 0.95 plant	Constant
0.99751	0.99502	0.99253	186	0.0003	-186737.50244

Sig T 0.95 cost is 0.4313

Multiple regression stepwise method

Multi –R	R –Square	Adjusted – R	B	Sig T 0.95 value	Constant
0.99751	0.99502	0.99253	186	0.0003	-186737.50244

The multiple regression analysis for the data for this company show that the data used are perfectly correlated (multiple R=0.99969). The variables in the equation explain the dependent variable (contract earning) up to 99.969 percent. Approximately 100 percent. So, there is no other variables that can be included as an independent variable in this company that can influence the dependent variable.

The sig T 0.95 value <sig T 0.95 cost (0.3229 < 0.413)

Therefore we reject the null hypothesis that the cost of plant used by this company did not influence the contract earnings more than the cost of labour used at five percent (5%) level.

Using the stepwise method, the value of plant used by this company is isolated as shown above. The sig T 0.95 profit is 0.0001 with that we accept the alternative hypothesis that is, the cost of this equipment used influence the contract earning of this company than the cost of labour at five percent (5%) level.

For the general equation $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots\ldots$

$b_1 = 7.63476$, $b_2 = -0.65597$, $b_3 = -1.31040$, $b_4 = 1981.71682$, $b_5 = 10.23345$.

That is

$$y = -163394.2713 + 7.63476X_1 - 0.65597X_2 - 1.31040X_3 - 1981.71682X_4 + 10.23345X_5$$

For any contract sum y, with the value of plant in company yard, the labour needed and the labour cost and with company mark up, the cost of plant needed can be estimated.

The analysis of variance shows that the variable in the equation are highly significant since F >sig F (320.61 >0.0424)

Hypothesis test for BF1 Construction Company

Multi –R	R- Square	Adjust –R	B	Sig T 0.95 value	Constant
0.80718	0.65154	0.21596	-3.53066	0.6902	-967904.254

Sig T0.95 is 0.1241

The multiple regression analysis for the data for this company show that the data used are correlated (positively – multiple R=0.80718). The variable involved in this equation explain the dependent variable (contract earning) up to 65.154 percent, but could be as low as 21.596 percent. There exist other variables that could explain the dependent variable up to 34.846 percent. Which are not included in the equation.

The sig T 0.95 value >sig T 0.95 cost (0.6902 >0.1241)

Therefore we accept the null hypothesis that the cost of plant used did not influence the contract earning for this firm than the cost of labour expended at five (5%) percent level for the various years selected.

For the general regression equation;

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots\ldots$

b1=84.98965; b2= 3.53066; b3= 7.980723; b4= 1155.29221; b5= -2.52334

$y = -9679047.254 + 84.98965X_1 - 3.53066X_2 + 7.980723X_3 + 1155.29221\ X_4$

$-.52334X_5$

Also this equation estimates the value of plant x2 needed for any contract sum y. that is when the estimate of plant is yard x1. the cost of labour x3 from when the number of labour x4 and the mark up x5 have been estimated.

Hypothesis test for BF2 Construction Company

Multiple regression analysis

Multi - R	R –Square	Adjusted –R	B	Sig T 0.95 value	Constant
0.99975	0.99951	0.99705	-7.28718	0.2768	-1737074.017

Sig T 0.95 cost is 0.1029

The multiple regression analysis for the data this firm show that the variables are perfectly correlated (multiple R=0.9975). The variables in the equation explain the dependent variable (contract earning) up to 99.951 percent.

The sig T 0.95value sig 0.95 cost (0.2768 > 0.1029)

Therefore we accept the null hypothesis that the cost of plant used by this company did not influence the contract earning more than the cost of labour used at five(5%) percent level.

For the general regression equation;

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 \ldots\ldots\ldots\ldots$$

$b_1 = 312.78488$, $b_2 = -7.28716$, $b_3 = 6.85928$, $b_4 = 8165.69866$, $b_5 = 1.63617$.

Therefore,

$$y = -1737074.017 + 312.78488X_1 - 7.28716X_2 + 6.85928X_3 + 1865.69866X_4 + 1.63617X_5$$

For any contract sum y, the sum of plant-needed X_2 can be estimated when the value of plant in the yard X_1, the cost of labour X_3 form the number of labourer X_4 and the company's mark up are estimated.

Test of hypothesis

Table of significant T for various variables for the building and civil construction firm and average percentage of equipment cost used.

	BF1	BF2	CF1	CF2
Sig T0.95 value	0.6902	0.2768	0.8002	0.3227
Sig T0.95 plant	0.5322	0.0890	0.1159	0.1436
Sig T0.95 cost	0.1241	0.1029	0.1505	0.4313
Sig T0.95 labour	0.9023	0.1081	0.2313	0.2472
Sig T0.95 profit	0.6573	0.2074	0.2313	0.0875
Average percentage of cost	0323	4.028	4.028	6.01

Null hypothesis (Ho): there is no significant difference between the influence of equipment cost on contracts for building and civil construction firms at five (5%) percent level for the various firms and years selected.

Alternative Hypothesis (Hi): there is significant difference between the influence of percentage of equipment for building and civil construction firms at five (5%) percent level for the various firms and years selected.

In the regression analysis when the sig T 0.95 of all the variable are compared equipment cost influences construction earning the list in all the building construction firm. In civil firms, equipment cost influence is list for one of the firms and is second only to labour cost (which is the significant) in another.

Therefore, the hypothesis that there is significant difference between the influence of equipment cost on construction earning fro building and civil construction firm at five (5) percent level for the various firm and year selected .

The average percentage cost of equipment to contract earnings for building construction firms is:

BF1=0.9323 percent; BF2=0.42 percent

For the civil construction firms

CF1=4.028; CF2=6.01 percent

From the above, the higher cost of equipment usage by civil construction firm (CF2) is six times that of the higher cost for building firms (BF1). Also the lower cost of equipment usage by civil construction firms (CF1) is ten times that of lower cost by building firm (BF2)

TEST OF HYPOTHESIS

Table of significant of various data for indigenous and foreign firm and average percentage of equipment cost used

	BCI1	BCI2	BCF1	BCF2
Sig T0.95 value	0.7412	0.2139	0.9884	0.9420
Sig T0.95 plant	0.6487	0.3013	0.8583	0.8114
Sig T0.95 cost	0.9666	0.1929	0.6653	0.3492
Sig T0.95 labour	0.3765	--	0.29390	0.8026
Sig T0.95 profit	0.8909	0.0701	0.0720	0.7133
Average percentage of cost	(.94	0.8116	2.6016	2.093

Null hypothesis (Ho): there is no significant difference in the influence of the cost of equipment on contract earning between foreign firms and indigenous firms at five (5) percent level for the firms and years selected.

Alternative Hypothesis(Hi): there is significant on contract earning between foreign firms and indigenous firms at five (5%) percent level for the firms and years selected .

The average percentage cost of equipment employed to contracted earnings for indigenous firms selected are:

BCI1=0.94; BCI2=0.8116

For foreign firm selected they are:

BCF1=2.6016; BCI2=2.03

The higher cost of equipment usage by the foreign firms is three times that of the cost of equipment usage by indigenous firms. Also the lower cost of equipment usage by the foreign firm is two and a half times the lower usage by indigenous firm (from the average percentage cost of equipment above).

When the significant T0.95 of the variables are compared, that of the value of equipment shows greater influence with indigenous firm than foreign firms. From the table above despite using lower percentage the cost of equipment usage is more significant to the indigenous firms than foreign firms.

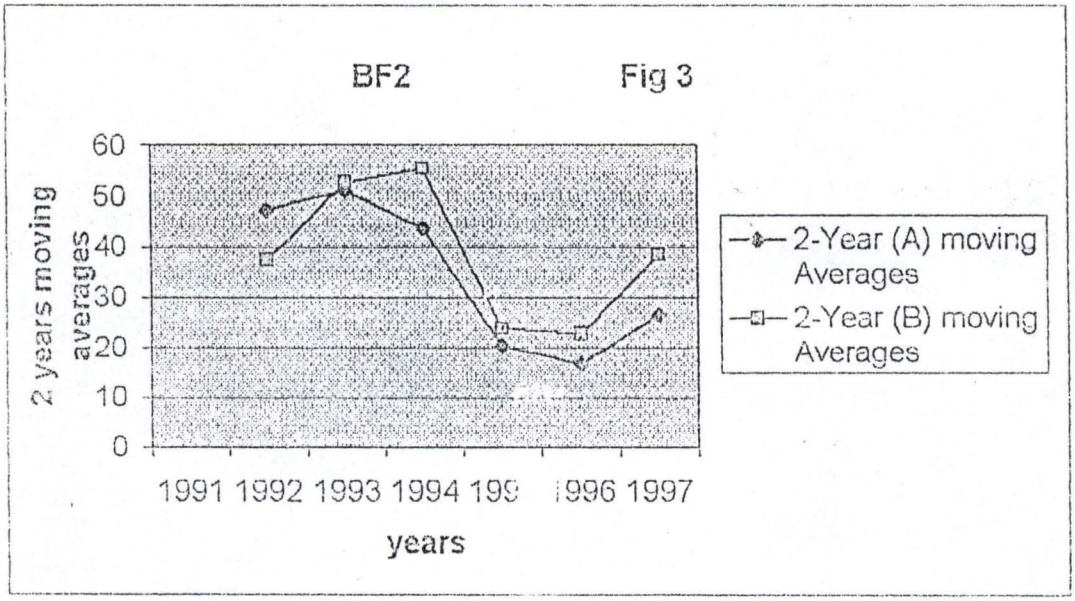
So, the hypothesis that there is a significant difference between the foreign and indigenous firms is accepted.

4.4 TREND ANALYSIS

GRAPHS OF MOVING AVERAGES FOR ALL CONSTRUCTION FIRMS

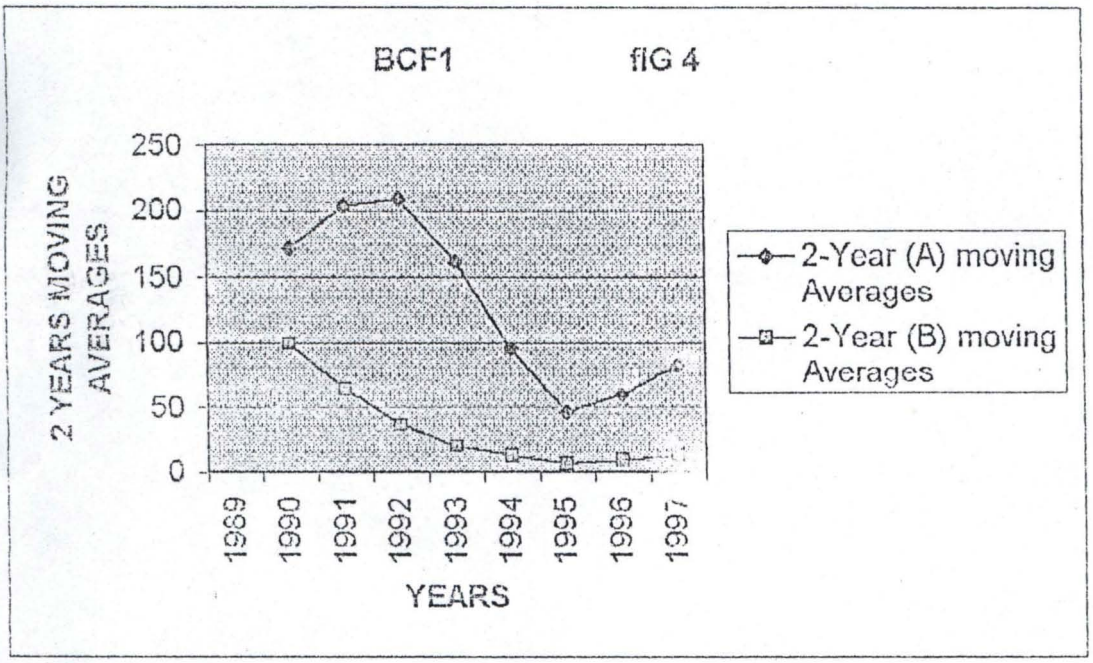
YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1991	54.6	55.1		
1992	39.7	19.5	47.2	37.3
1993	62.4	85.5	51.1	52.5
1994	24.3	25.1	43.4	55.3
1995	16.1	22.1	20.2	23.6
1996	16.6	22.9	16.4	22.5
1997	36.1	53.9	26.4	38.4

Table 41



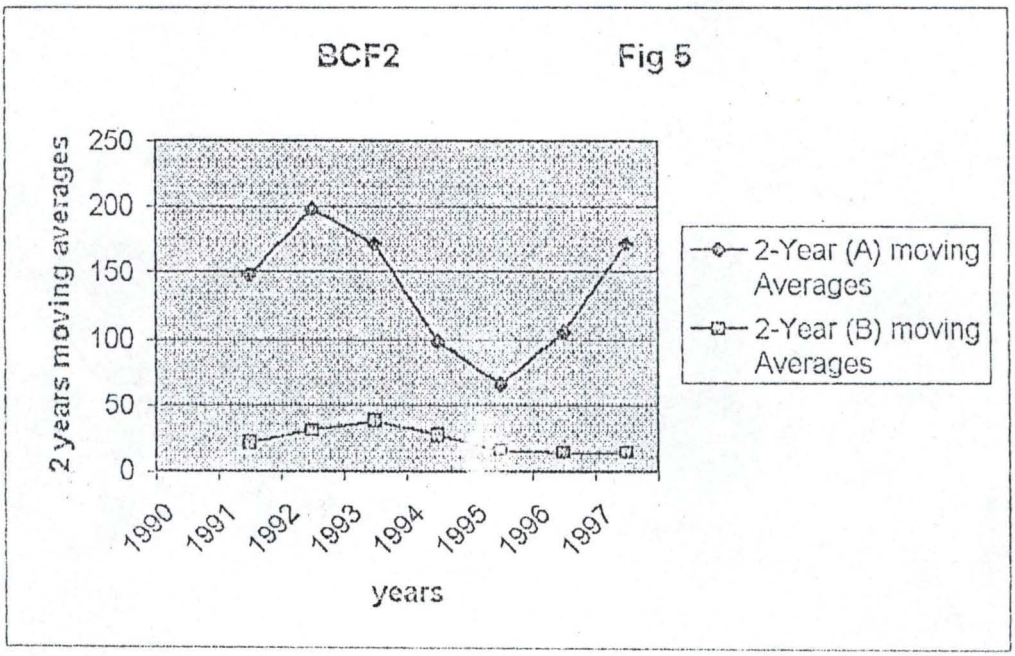
YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1989	178	120.9		
1990	164.8	75.6	171.4	98.3
1991	242	52.2	203.4	63.9
1992	174.9	18.9	208.5	35.6
1993	148.4	19.2	161.7	19.1
1994	41.5	4.8	95	12
1995	49	6.5	45.3	5.7
1996	68.9	9.7	59	8.1
1997	95.7	13.7	82.3	11.7

Table 42



YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1990	107.1	17.9		
1991	188.3	24.6	147.7	21.3
1992	206.4	37.4	197.4	31
1993	135	38.9	170.7	38.2
1994	60.5	14	97.8	26.5
1995	71.5	17.3	66	15.7
1996	137.3	11.7	104.4	14.5
1997	204.9	16.6	171.1	14.2

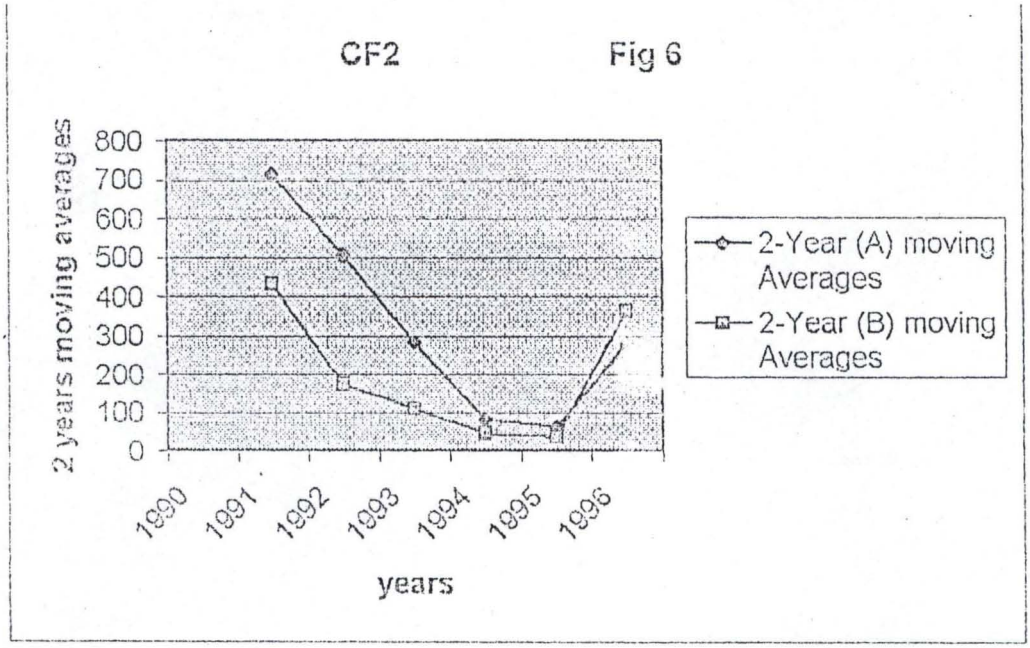
Table 43



YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1990	886.3	682.4		
1991	542.5	183.9	714.4	433.2
1992	470.2	165.3	506.4	174.6
1993	93.7	54.7	282	110
1994	67.6	37.5	80.7	46.1
1995	55.8	37.4	61.7	37.5
1996	505.2	688.3	280.5	362.9

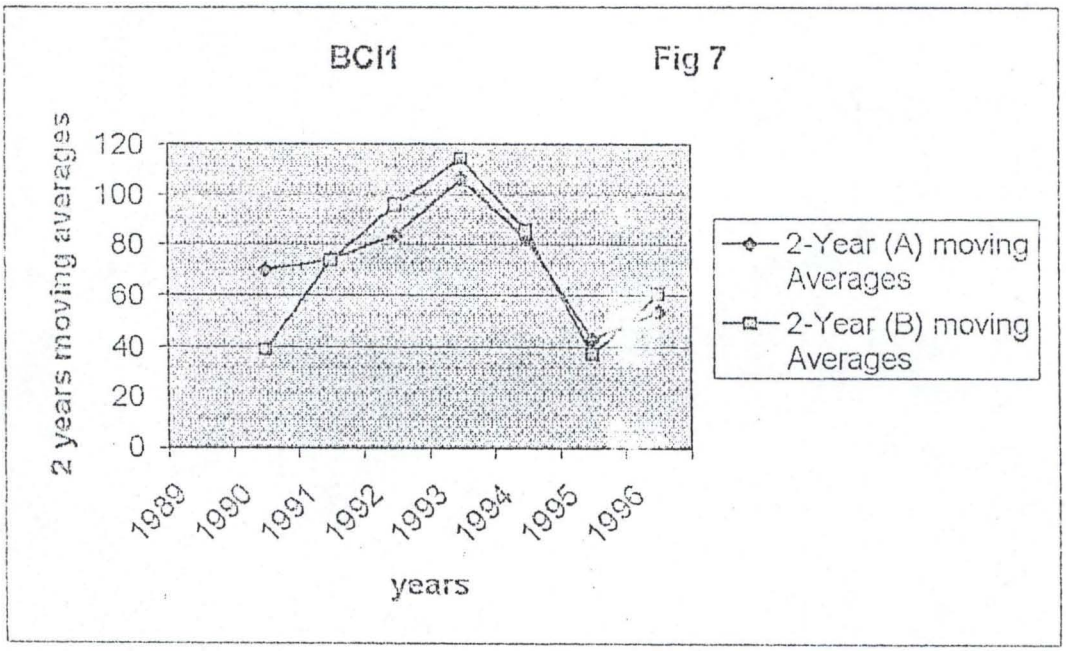
Table 44

CF2 Fig 6



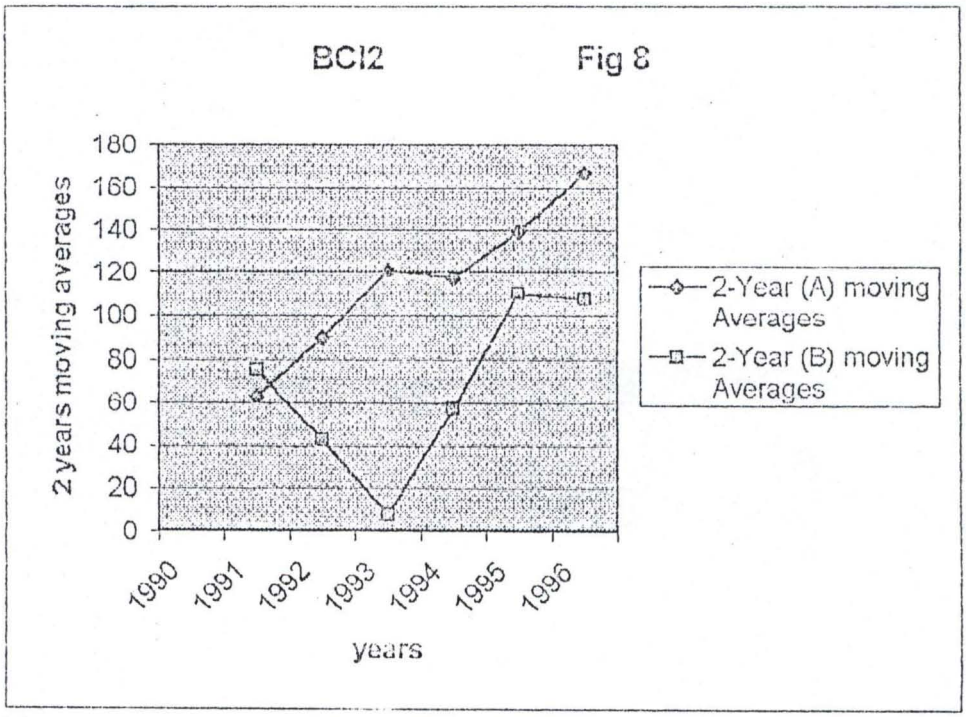
YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1989	71.3	31.9		
1990	68.1	45.1	69.7	38.5
1991	80	102.2	74.1	73.7
1992	87.4	89	83.7	95.6
1993	124.3	138.9	105.9	114
1994	40.1	31.8	82.2	85.4
1995	45.3	41.7	42.7	36.8
1996	62	79.4	53.7	60.6

Table 45



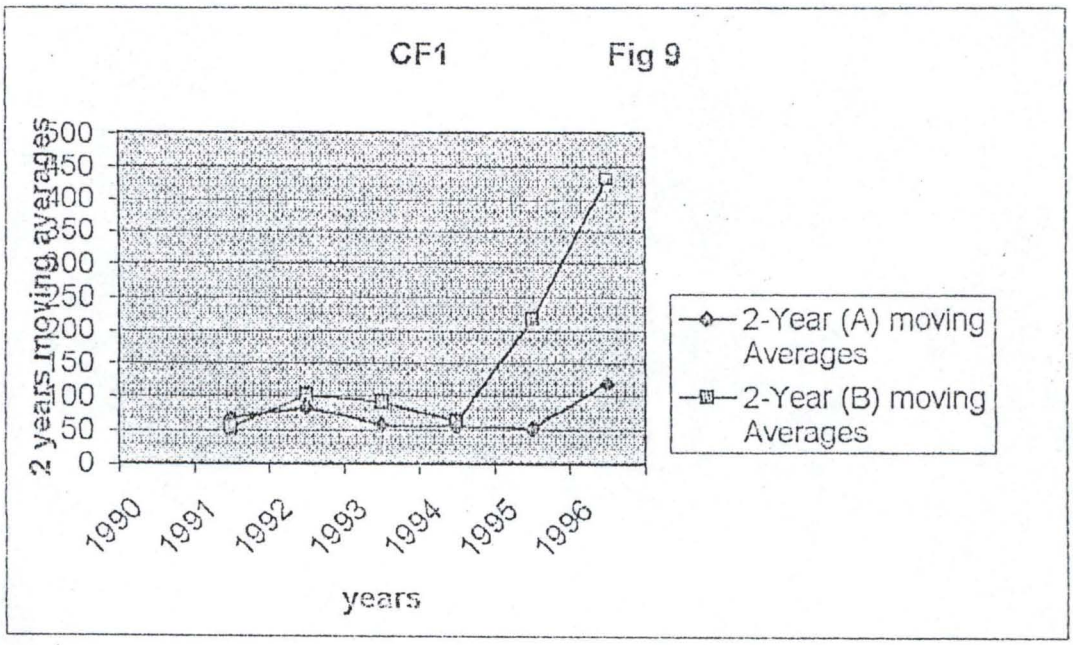
YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1990	59.9	75.9		
1991	65.6	74.1	62.8	75
1992	1139	11.1	89.8	42.6
1993	127.6	3.6	120.8	7.4
1994	106.5	110.3	117.1	57
1995	172	110.1	139.3	110.2
1996	60.8	105.7	166.4	107.9

Table 46



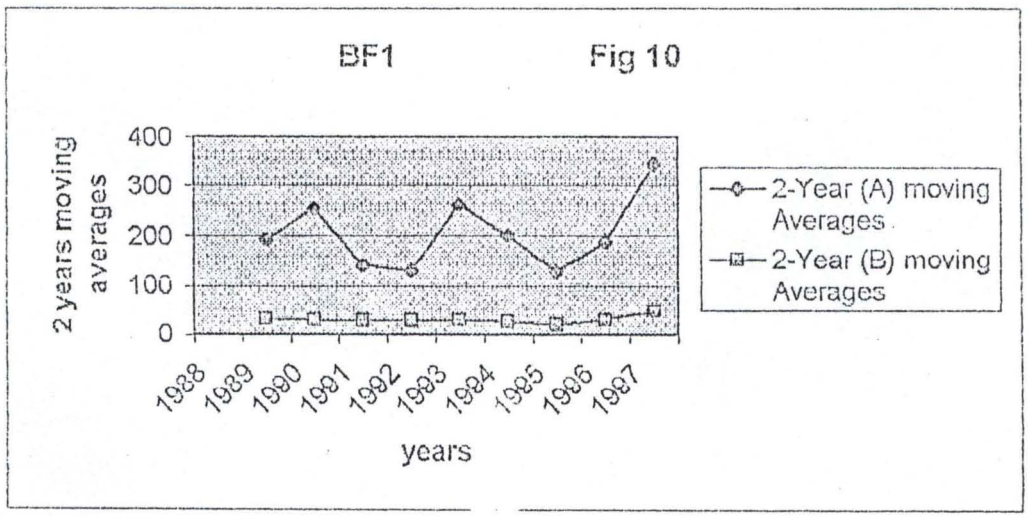
YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1990	52.6	26.3		
1991	79	82.2	65.8	54.3
1992	87.4	118.2	83.2	100.2
1993	27.2	65.1	57.3	91.7
1994	28.6	57.4	55.8	61.3
1995	76.2	375.5	52.4	216.5
1996	161.3	484.5	118.75	430

Table 47



YEAR	A	C	2-Year (A) moving Averages	2-Year (B) moving Averages
1988	126.5	27.8		
1989	255.5	32.7	191	30.3
1990	251.8	26.5	253.7	29.6
1991	26.6	28.1	139.2	27.3
1992	230.5	24.1	128.6	26.1
1993	288.8	32.6	259.7	28.4
1994	107.6	17.4	198.2	25
1995	142.6	18.5	125.1	18
1996	228.3	39.1	185.5	28.8
1997	458	51.8	343.2	45.5

Table 48



A. BF1 CONSTRUCTION FIRM

From the graph above the value of contract earnings rose steadily to a peak in 1991, it then dropped to the lowest in 1994 and steadily rose again. On the other hand the cost of plant used started dropping since the late 1980s dropped to the lowest in 1994 and remained fairly stable at the 1994 value. There is enough evidence that there is no significant relationship in the trend of equipment used for contract earnings in this firm.

B. BF2 CONSTRUCTION FIRM

The value of contract earnings started dropping in 1991 and was lowest in 1994 where is started rising again. The cost of equipment used started dropping in 1992 and was lowest in 1994. The cost remained fairly steady at the 1994 value. There is no significant relationship in the trend equipment used for contract earnings.

C. BCF1 CONSTRUCTION FIRM

There is a noticeable rise in contract earnings till 1992 where it dropped to it lowest in 1994. The value started rising again since 1994. The cost of plant used followed a similar trend. There is a significant relationship between the trend of contract and cost of equipment used.

D. BCF2 CONSTRUCTION FIRM

The value of contract earnings increased steadily from the late 1980s throughout the years selected. But the cost of equipment used decreases from 1980s to its lowest in 1992. Against other trends, the cost of equipment used started increasing from 1992 through to the end of the year selected. For this firm, there is no significant relationship between the trend of contract earnings and equipment used.

E. CF1 CONSTRUCTION COMPANY

While volume of both the contract earnings and the cost equipment used rose before 1992, their values increased since then but the decrease in equipment use became more prominent. The volume of contract earnings got to the lowest in 1994 and rose sharply thereafter. But the decrease in the cost of equipment used remains steady and low at the 1993 figure until 1995 when a sharp increase is noticed. There is a significant relationship in the trend of the cost of equipment used and the contract earning.

F. CF2 CONSTRUCTION COMPANY

For this company the cost of equipment used for contract earnings, follow similar trend closely. The two were at there lowest value 1994. There is a significant relationship in the trend of the cost of equipment used and value of contract earnings for the company.

G. BF1 CONSTRUCTION COMPANY

While the contract earnings fluctuates and was at the lowest 1994. The cost of equipment used was steady and only dropped gradually to its lowest in 1994. There is no significant relationship in the trend of equipment used and the contract earnings.

H. BF2 CONSTRUCTION COMPANY

The value of equipment used follows that of the contract earnings, rising to the peak 1992. They both fall to the lowest 1995, before another sharp rise together. There is a significant relationship in the trend of equipment used for contract earning for this company.

CHAPTER FIVE

5.0 FINDINGS OF THE ANALYSIS

5.1 CORRELATION AND REGRESSION

Observations will be based on the tests carried out, the analysis done and the supportive tables and graphs presented

(i) Out of the two indigenous Building and Civil Construction Companies studied, the cost of equipment used did not influence the construction earning more than the cost of labour employed in one of the firms. But it does for the second firm.

(ii) For the two Building and Civil Construction Companies studied, the cost of equipment used did not influence the contract earnings more the cost of labour.

(iii) For the foreign Civil Construction Firms, the cost of equipment used influenced the contract earning more the cost of labour for one of the firms. But did not for the other.

(iv) For the two Building Construction Firms the cost equipment used did not influence the contract earnings more than labour cost in the two cases.

(v) It is observed that with civil construction firms the more the construction earnings the more the equipment needed.

5.2 ANALYSIS OF VARIANCE

Generally Analysis of variance for all the selected companies shows that there are no two variables that have the same or equal effect in terms of influencing the contract earning except BF2 company that has at least two independent variables that influence the dependent variable (contract earning) almost equally since F and significant F value are almost equal (F = 0.69530 and sig F = 0.6789).

The general discussion of the above findings can be highlighted as follows:

The literature review and project analysis in chapters two and four emphasized on the roles and influence of construction equipment on construction delivery in Nigeria. This influence may be observed in two broad spheres. On one hand, it may be a response to the Nigeria local environment. This is a preferred option. On the other hand it may also be a product of the firm's formulated policies and interests. The

latter policy may be influenced by many external factors. And some of these may be detrimental to the expected growth and roles of the construction industry in Nigeria. Prominent among these is the global trend towards increase mechanization of the construction work place. This is definitely at variance with the development aspiration of the Nigerian construction industry.

The local Nigerian environment aforementioned have infrastructural, political and economic dimensions. The state of energy supply is an aspect infrastructure. Also the structural adjustment programme (SAP) is a component of the economic environment. The unstable political environment especially since 1993 and the labour unrest are all political dimensions. It must be emphasized that while some of the labour unrest are wage motivated others are politically motivated. The high population and employment rates and the aspect of wage agitation are also important areas of the Nigerian economy.

On the political front, Raftry (1991) opined that in the construction industry, employment is project directed. Therefore equipment is once again adversely affected. Of particular interest is the June, 1993 election crises. This had its toll on the economy activities in the ports, energy supply and availability of labour. As a response therefore, except the BCI2 construction firm, all the companies studied employed the least cost of equipment between 1993 and 1994. The peak of the crises was the year 1994 and that was the year of least used of equipment as is reflected in the equipment cost for the companies studied. Therefore the mix of equipment and labour responded sensitively to the political environment.

As a result of the introduction of SAP and the devaluation of national currency, the prices of fuel was increased in 1988, 1990 and 1995. The political crises in the year 1993-1994 led to a strike by the oil workers in Nigeria and also intermittent sit-at-home action were observed in Lagos. Lagos is the Nigerian most important port city and the economic nerve centre of the country. The overall effect of these, is a serious crises in the energy sector that led to shut supply of fuel. Also prices at that time skyrocketed. Construction companies reacted sharply only to this crisis with the least use of equipment during this period. Furthermore the Arbico plc annual report (1994) posited that the damaging effect of the energy crisis almost eventually became a

permanent feature of the Nigerian national life since 1994. Again half of the companies studied responded sensitively by almost maintaining the 1993-1994 value of equipment usage. Thisis despite sharp increase in their yearly revenue through construction earnings from 1995. This particularly noticed in BCF1, BCF2, CF1 and BF2 construction companies.

However, the analysis of the data used did not show any sensitive response to the official upward review of the pump prices of the petroleum products. This might not be unconnected with the fact that price increases in inputs are passed unto the clients in form of variation claims. For fresh contracts the increases are built into the bills.

High population with high unemployment rate is another dimension to the Nigerian situation. The Guardian (1998), reported that about two hundred thousand jobs were lost in the first quarter of 1998. The ministry of Labour gave the figure of registered unemployed and vacancies for the lower grade workers between 1989 and 1992 as 1989; 295,965; 1990; 233,110; 1991; 239,403 and 1992; 189,064 respectively. The urban unemployment rate for the year is given as 7.5 in 1989, 5.9 in 1990, 4.9 in 1991 and 4.6 in 1992. These figures are more relevant to the lower grade workers who are mostly displaced by mechanization. It is also observed that the unemployment rate is very high compared to the advance countries where a rate of 3.0 is seen as being too high. But a downward trend is noticed since 1989. This however can not be traced to the use of equipment as has been reflected in the companies selected for this study. This is because, only BCF1 construction company shows a definite downward trend in the use of equipment throughout the period. Therefore, this reduction in the unemployment rate must be due to other factors that may have stimulated job creation. During this period the activities of the Directorate of Employment, the waste to wealth programme and similar programmes were increasingly on stream. This must have produced the observed position impact on the unemployment rate.

Of relevance to this study is the agitation and wage increases in 1988, 1990 and 1994. To this the construction companies studied did not show an appreciable response. But a marginal increase in the cost of human labour in four of the eight construction companies studied is noticed from 1993 –n 1994. These companies are BCF1, BCF2, CF1 and CF2. Generally construction companies find it relatively easier to adjust to

adverse plant environment by increasing the use of human labour. It then implies that during the 1993-1994 crises, more cost were expended on labour for the companies mentioned above.

On the use of labour generally, it is noticed that for the CF1 construction company, the years 1985 and 1986 were years of heavy use of human labour. They are also years of loses. Earlier in the study, Aluko's study (1980) in Nigeria, show that capital intensive manufacturing industry has lower average cost than labour intensive industry.

5.3 CONCLUSION

Judging from the trend of employment of equipment for the companies studied the yearly percentage of cost expended in the 1980s is more than in the 1990s. therefore, it can be concluded that construction is not becoming equipment intensive.

It can also be concluded that the cost of equipment needed for construction responded more sensitively to the economic environment than political policies (like the goal of equipment in the National construction policy). Energy is thus an effective weapon for controlling the cost of equipment expended on construction in Nigeria. The varying mix of labour and plant is still heavily in favour of labour. Labour is most favoured by the building sub-sector followed by building and civil firms.

The highest proportion of plant used is recorded by civil construction firms. It can then be concluded that job creation effort, using the construction industry will be more efficiently done with the building sector. On the whole, while labour influence construction earning more than equipment, their values, as input can be kept low than it was used before 1993. The 1993-1994 mix can be a reference point for the indigenous firm, equipment used weigh heavily on its earning than the foreign firm despite expending less cost.

On the whole, political instability adversely affected construction industry than all the policies introduced throughout the period selected for the study. The overall construction earning during the 1993-1994 instability was lowest. It can also be

concluded that since the influence of equipment on construction earning is not significant for six of the construction companies selected, then the Nigerian economy still upholds the theory that human resources is more important than equipment for the construction industry in Nigeria.

RECOMMENDATION

- In view of the great discrepancies observed in the percentage cost expended on labour for different years and for the different categories of construction companies specific minimum standard should be worked out. The maximum percentage cost observed in this study which goes along with an optimum profit should used.
- When the above have been worked out, its implementation should be confirmed from priced bill. That should be one of the criteria used for successful tenders.
- Couple with the above there is a need for a percentage ceiling for equipment costs to be expended on construction delivery in Nigeria, this cost may be worked out on the average 1993 to 1995 cost. Again different percentage should be used for the different of the labour unrest are wage motivated, others are politically motivated. The high population and employment rates and the aspect of wage agitation are also important areas of the Nigerian economy. Categories of firms (building, civil and building & civil). This should be also be confirmed for successful tendering.
- While input resources (fuel and energy) should be used as a strategic weapon to discourage excessive use of equipment, wages must be kept in a state to make equipment usage unattractive.
- When employment generation is aimed at as a national policy, the building sector should be accorded more attention. This is in view of the high percentage of manual labour used compared to civil and civil & building.
- As a global measure, all efforts must be made to encourage political stability in Nigeria. The economic activity as shown between 1993-1994 is so low and is almost comparable to that of the civil war in Nigeria. While equipment usage is more affected both construction earnings and of labour were also very low.

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APPENDICES

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter
VALUE PLANT COST LABOR PROFT

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variable(s) Entered on Step Number

1..	PROFT	profit
2..	PLANT	value of plant used
3..	LABOR	no. of labourers
4..	COST	cost of labour
5..	VALUE	value of plant

BCJ1

GODA NIG LtD

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Multiple R	.97593
R Square	.95244
Adjusted R Square	.83353
Standard Error	107678.33483

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	464368790605.47288	92873758121.0946
Residual	2	23189247584.19416	11594623792.0971

F = 8.01007 Signif F = .1147

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
PROFT	-.62043	3.99531	-.03959	-.155	.8909
PLANT	111.76491	210.62114	1.64598	.531	.6487
LABOR	-1.51575	1.34392	-.39403	-1.128	.3765
COST	.77295	16.37574	.03386	.047	.9666
VALUE	-11.39981	30.09138	-.98160	-.379	.7412
(Constant)	584079.73494	442774.9535		1.319	.3179

```
include "ces1"
data list free/contract value plant cost proft.
variable labels contract "contract earning"
                value "value of plant"
                plant "value of plant used"
                cost "cost of labour"
                proft "profit".
begin data
end data.
      7 cases are written to the compressed active file.

This procedure was completed at 15:07:02
regression var = contract value plant cost proft
/dependent = contract
/method = enter value plant cost proft.
```

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter
VALUE PLANT COST PROFT

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variable(s) Entered on Step Number

1..	PROFT	profit
2..	PLANT	value of plant used
3..	COST	cost of labour
4..	VALUE	value of plant

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Multiple R	.98191
R Square	.96415
Adjusted R Square	.89244
Standard Error	140809.41167

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	1066348449884.30144	266587112471.075
Residual	2	39654580829.20608	19827290414.6030

F = 13.44546 Signif F = .0704

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End Block Number 1 All requested variables entered.

APPENDIX F

```
This procedure was completed at 15:18:43
include "ces6".
data list free/ contract value plant cost labor proft.
variable labels contract "contract earning"
                value "value of plant"
                plant "value of plant used"
                cost "cost of labour"
                labor "no. of labourer"
                proft "profit".
begin data
end data.
      8 cases are written to the compressed active file.

This procedure was completed at 15:20:31
regression var = contract value plant cost labor proft
/dependent = contract
/method = enter value plant cost labor proft.
```

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter

VALUE PLANT COST LABOR PROFT

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variable(s) Entered on Step Number

1..	PROFT	profit
2..	LABOR	no. of labourer
3..	COST	cost of labour
4..	PLANT	value of plant used
5..	VALUE	value of plant

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Multiple R	.79675
R Square	.63480
Adjusted R Square	-.27819
Standard Error	6491255.0259

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	146487678372417.024	29297535674483.4
Residual	2	84272783623376.224p	42136391811688.1

Equation Number 1 Dependent Variable.. CONTRACT contract earning

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
PROFT	14.34416	4.01271	1.45248	3.575	.0701
PLANT	38.57773	27.92819	.40908	1.381	.3013
COST	-16.37139	8.46957	-1.19864	-1.933	.1929
VALUE	3.51605	1.95468	1.79726	1.799	.2139
(Constant)	-4514.03514	581590.4431		-.008	.9945

End Block Number 1 All requested variables entered.

This procedure was completed at 15:07:27

APPENDIX B

```
review "ces2".
```

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```
include "ces2".
data list free/contract value cost plant labor proft.
variable labels contract "contract earning"
                value "value of plant"
                cost "cost of labour"
                plant "value of plant used"
                labor "no. of labours"
                proft "profit".
begin data
end data.
     10 cases are written to the compressed active file.

This procedure was completed at 15:09:46
regression var = contract value cost plant labor proft
/dependent = contract
/method =enter value cost plant labor proft.
```

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter
VALUE COST PLANT LABOR PROFT

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* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variable(s) Entered on Step Number
1.. PROFT profit
2.. COST cost of labour
3.. LABOR no. of labourer
4.. PLANT value of plant used
5.. VALUE value of plant

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**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Multiple R .99649
R Square .99298
Adjusted R Square .98129
Standard Error 9388604.3164

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	37429536325796576.0	7485907265159316
Residual	3	264437673028889.120	88145891009629.7

F = 84.92633 Signif F = .0020

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**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. CONTRACT contract earning

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
PROFT	18.76013	6.87545	.61634	2.729	.0720
COST	.37820	.79114	.04527	.478	.6653
LABOR	4375.02308	3446.90354	.32679	1.269	.2939
PLANT	2.80018	14.41038	.16223	.194	.8583
VALUE	.04843	3.05717	.01614	.016	.9884
(Constant)	-55972631.64	39888009.33		-1.403	.2551

End Block Number 1 All requested variables entered.

This procedure was completed at 15:16:15

review "ces6".

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```
include "ces6".
data list free/ contract value plant cost labor proft.
variable labels contract "contract earning"
                value "value of plant"
                plant "value of plant used"
                cost "cost of labour"
                labor "no. of labourer"
                proft "profit".
begin data
end data.
```

8 cases are written to the compressed active file.

```
=        .69530       Signif F =  .6789
```

```
age 40                    SPSS/PC+ Studentware

        * * * *  M U L T I P L E  R E G R E S S I O N  * * * *

quation Number 1    Dependent Variable..   CONTRACT   contract earning

---------------- Variables in the Equation ----------------

Variable            B         SE B       Beta        T  Sig T

PROFT          -7.21808     17.05377    -.39931    -.423  .7133
LABOR         952.17743   3342.93120     .16110     .285  .8026
COST            8.07397      6.66083     .81437    1.212  .3492
PLANT          27.59591    101.61210     .50333     .272  .8114
VALUE           1.28093     15.59257     .19675     .082  .9420
(Constant) -204457.0267 8827211.883               -.023  .9836

End Block Number   1   All requested variables entered.

This procedure was completed at 15:20:55
review "ces7".
```

BCF2

APPENDIX G

```
Page 42                   SPSS/PC+ Studentware
include "ces7".
data list free/contract value plant cost labor proft.
variable labels contract "contract earning"
                value "value of plant"
                plant "value of plant used"
                cost "cost of labour"
                labor "no. of labourers"
                proft "profit".
begin data
end data.
     7 cases are written to the compressed active file.

his procedure was completed at 15:22:22
egression var = contract value plant cost labor proft
dependent = contract
/method =enter value plant cost labor proft.
```

```
age 43                    SPSS/PC+ Studentware

        * * * *  M U L T I P L E  R E G R E S S I O N  * * * *

stwise Deletion of Missing Data

uation Number 1    Dependent Variable..   CONTRACT   contract earning

ginning Block Number  1.  Method:  Enter
  VALUE     PLANT     COST      LABOR     PROFT
```

```
ge 44                     SPSS/PC+ Studentware

        * * * *  M U L T I P L E  R E G R E S S I O N  * * * *

ation Number 1    Dependent Variable..   CONTRACT   contract earning

iable(s) Entered on Step Number
1..     PROFT      profit
```

```
regression var = contract value plant cost labor profit
/dependent = contract
/method =enter value plant cost labor proft.
```

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter
VALUE PLANT COST LABOR PROFT

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variable(s) Entered on Step Number

1..	PROFT	profit
2..	PLANT	value of plant used
3..	VALUE	value of plant
4..	LABOR	no. of labour
5..	COST	cost of labour

efi
DUMEZ NIG LTD

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Multiple R	.99913
R Square	.99827
Adjusted R Square	.98959
Standard Error	466515.23888

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	125235353990627.824	25047070798125.6
Residual	1	217636468111.14160	217636468111.142

F = 115.08674 Signif F = .0706

*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
PROFT	6.11059	2.78859	.25543	2.191	.2726
PLANT	13.31024	2.45140	.52587	5.430	.1159
ALUE	-.08584	.26445	-.02586	-.325	.8002
BOR	893.41803	339.74443	.17867	2.630	.2313
	1.47726	.35595	.46545	4.150	.1505

End Block Number 1 All requested variables entered.

This procedure was completed at 15:12:13

review "ces4". APPENDIX D

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```
include "ces4".
data list free/contract value plant cost labor proft.
variable labels contract "contract earning"
                value "value of plant"
                plant "value of plant used"
                cost "cost of labour"
                labor "no. of labourers"
                proft "profit".
begin data
end data.
```

7 cases are written to the compressed active file.

This procedure was completed at 15:13:45

```
regression var = contract value plant cost labor proft
/dependent = contract
/method =enter value plant cost labor proft.
```

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter

VALUE PLANT COST LABOR PROFT

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variable(s) Entered on Step Number

1..	PROFT	profit
2..	PLANT	value of plant used
3..	LABOR	no. of labourers
4..	COST	cost of labour
5..	VALUE	value of plant

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*** * * * M U L T I P L E R E G R E S S I O N * * * ***

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Multiple R	.99975
R Square	.99951
Adjusted R Square	.99705
Standard Error	98310.55682

BF2

ARCICO PLC

	DF	Sum of Squares	Mean Square
Regression	5	19642201082264.532(	3928440216452.91
Residual	1	9664965583.23069	9664965583.23069

F = 406.46189 Signif F = .0376

**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
PROFT	1.63617	.55276	.32777	2.960	.2074
PLANT	312.78488	44.01500	.43158	7.106	.0890
LABOR	1865.69866	320.48074	.29278	5.822	.1083
COST	6.85928	1.11815	.56588	6.134	.1029
VALUE	-7.28716	3.38451	-.32119	-2.153	.2768
(Constant)	-1737074.017	250912.3070		-6.923	.0913

End Block Number 1 All requested variables entered.

This procedure was completed at 15:14:07
review "ces5".

```
include "ces5".
data list free/contract value plant cost labor proft.
variable labels contract "contract earning"
                value "value of plant"
                plant "value of plant used"
                cost "cost of labour"
                labor "no. of labourer"
                proft "profit".
begin data
end data.
    9 cases are written to the compressed active file.

This procedure was completed at 15:15:36
regression var = contract value plant cost labor proft
/dependent = contract
/method =enter value plant cost labor proft.
```

**** MULTIPLE REGRESSION ****

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. CONTRACT contract earning

Beginning Block Number 1. Method: Enter
VALUE PLANT COST LABOR PROFT

**** MULTIPLE REGRESSION ****

Equation Number 1 Dependent Variable.. CONTRACT contract earning