FACTORS AFFECTING DELAYED PAYMENTS ON DONOR FUNDED ROAD PROJECTS IN GHANA

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By

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DECLARATION

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Signature …… Date ……

ABSTRACT

Payment for donor funded road projects to Contractors in Ghana delays and the Government spends huge sums of money to pay interest due to this delay. Attempt to find solution to this problem is laudable.

The aim of this research was to identify the significant factors that affect delayed payments on donor funded road projects in Ghana and offer recommendations to minimise or curtail them. To achieve this aim, a survey questionnaire was designed to elicit opinions from Pubic/Civil Servants, Contractors, Civil Works Consultants and Donor Agencies. Purposive sampling technique was used and out of the 304 questionnaires distributed, 130 were received representing a response rate of 42.76%.

Exploratory Factor Analysis (EFA) was run for dependent variables using the principal component analysis as the extraction method and the varimax criterion as the rotation method to eliminate variables that are not factorially pure. This resulted in fourteen (14) dependent variables which were grouped under four principal factors i.e. Project Management, Coordination among Contracting Parties, Client's Financial Management and Client's Administration. The fourteen (14) significant variables were subjected to Kendall's Concordance Coefficient and Chi-Squared Tests to ascertain the agreement among the four respondent groups. It was found that the respondents were in agreement to the significance of the entire fourteen (14) variables.

It is recommended that contracts should be awarded to competent Consultants and Contractors with qualified personnel; Clients, Consultants and Contractors should all see

the project as their own and coordinate effectively among themselves, Government should show serious financial commitment to every donor funded road project and personnel involved with the processing of the certificate should be trained more especially in the conditions of contract regarding payment, either in-house or through seminars.

DEDICATION

This Dissertation is dedicated to my father the late **JAMES KOFI DONKOR**, my mother **NYAME-BEKYERE DONKOR,** my wife **BETTY EWURAMA DONKOR** and my children **EZEKIEL NANA-BANYIN DONKOR JR, ABENA NYAME-BEKYERE DONKOR** and **JULIEN PAPA KWASI DONKOR.**

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Most of Ghana's capital-intensive projects such as Roads, Ports and Dams are partly or wholly funded with donor funds. Government of Ghana(GOG) in an effort to utilise effectively these donor funds, procures experienced consultants and contractors to execute these projects according to specification and within specified period. The client, consultant and the contractor becomes parties to this project.

Most of these capital-intensive projects have clauses in the conditions of contract which spells out specific period within which the contractor should be paid after submission of monthly statement to the consultant for certification and onwards payment by the client. In the event that the Interim Payment Certificate (IPC) is not paid within the contractual stipulated time, delay is said to have occurred and the conditions of contract make provision for the contractor to claim for interest on the delayed payment, if the IPC is later paid.

In many instances, the contractor is not paid within the contractual specified period and this negatively affects the cash flow of the contractor, coupled with the fact that the contractor incurs additional cost since the interest rate, used in most instances to calculate the interest on the delay payment, is less than the commercial borrowing rate.

In addition, the Government of Ghana (G.O.G) spends additional funds to defray the cost of this delayed payment of the IPCs.

Aibinu A.A and Odeyinka H. A. (2006) paper " Construction Delays and Their Causative Factors in Nigeria" made reference to Chang(2002) suggestion that "identifying reasons is usually the first step when addressing a problem and then corrective actions can be taken". Hence scientific identification of the number of factors that cause the delayed payment of I.P.Cs on donor funded road project will help in preventing or reducing this delay.

1.2 PROBLEM STATEMENT

Oppong B.(2003) research on ''Causes of Construction Delays in Ghana" identify that delay in payment to contractors for work done rank as number one(1) cause of construction delay in Ghana, from the perspective of Clients, Contractors and Consultants.

Honouring payment certificate for Donor funded capital-intensive projects such as Roads, in Ghana really delays. Albeit interest is paid on the delayed payment certificates, contractors do not get the real value of the amount if the certificate is later honoured. Also in paying interest on delayed payment certificates, government looses substantial amount of money which could have been used for other laudable projects.

A search on some final certificates of completed donor funded road projects in Ghana Highway Authority (GHA) and Department of Urban Roads (DUR) reveals the following substantial amount of money paid for delayed payment:

- GH¢ 145,223.02 and Euro € 59,939.68 - "Abuakwa-Bibiani Road Project" (GHA). This represents 1.64% of the contract price.
  Contract date was 6/5/2003 and Final Certificate date was 24/11/2008
- GH¢ 964,293.61 and US$ 113,515.13 - " Reconstruction of Mallam-Kasoa Road" (GHA). This represents 4.35% of the contract price.
  Contract date was 2/2/2004 and Final Certificate date was 21/11/2008
- € 570,168.66 "Road Rehabilitation and Traffic Management Works in Tema and Sekondi-Takoradi" (DUR). This represents 3.29% of the contract price.
  Contract date was 6/01/2003 and Final Certificate date was 9/03/2007

There are a number of variables that contribute to the delayed payment. It could be due to client's cash flow problems (counter part funding), late preparation of interim valuation, inaccurate bills of quantities, etc. It is therefore imperative to determine these variables contributing to the delay in honouring payment certificate from the perspective of the Donor Agencies, Clients, Consultants and the Contractors who are parties to the road projects.

1.3 AIM

The main aim of this study is to identify the significant factors that affect delayed payment which will greatly provide a basis for policies to be implemented to prevent or reduce the delay in honouring payment certificates on donor funded road projects in Ghana.

1.4 RESEARCH OBJECTIVES

Specific objective are:

1 To identify from literature and other sources the variables affecting delayed payment on donor funded road projects in Ghana.

2 To identify the significant variables affecting delayed payment on donor funded road projects in Ghana.

3 To determine whether there is discrimination among Clients, Donor Agencies, Consultants and Contractors in assessing the variables affecting the delayed payment on donor funded road projects in Ghana.

1.5 HYPOTHESIS/KEY QUESTION

The following Hypotheses will be investigated:

- The main variables affecting the delay in honouring payment certificates are the number of processes the certificate has to go through and the number of signatories appended to the certificate before payment is made to the contractor.

1.6 JUSTIFICATION OF RESEARCH

The statement of the problem gives indication to the fact that there is a delay in honouring payment certificate on donor funded road projects. This delay in payment leads to G.O.G spending substantial amount of money, which could have been used for other laudable projects. The contractor on the other hand also incurs cost as a result of this delay in payment and the project as whole delays in completion.

The research seeks to find the significant variables that cause the delay, from the point of views of the Clients, Donor Agencies, Consultants and Contractors on donor funded road projects in Ghana.

It is the hope that with the knowledge of the factors affecting delayed payment, all the parties to the projects will take concrete steps to prevent or reduce the delay in payment certificates.

1.7 SCOPE OF STUDY

The study will be restricted to donor funded road projects from the following government establishments:

- Department of Feeder Roads,
- Department of Urban Roads
- Ghana Highway Authority

REFERENCES

1 Aibinu, A.A and Odeyinka, H. A. (2006), Construction Delays and Their Causative Factors in Nigeria, Journal of Construction Engineering and Management © ASCE/July 2006

2 BI/ABP Consult Ltd, (Final Certificate March 2007), Road Rehabilitation and Traffic Management Works in Tema and Sekondi-Takoradi Department of Urban Roads, Ministry of Transportation.

3 Chang, A.S (2002), Reasons for cost and schedule increase for engineering design projects J. Manage. Eng., 18(1), 29-36.

4 Oppong Ben (2003), Causes of Construction Delays in Ghana, Department of Building Technology, Kwame Nkrumah University of Science and Technology (Unpublished Thesis)

5 Scetauroute International & Associated Consultants, (Final Certificate November 2008), Abuakwa-Bibiani Road Project, Ghana Highway Authority.

CHAPTER TWO

DELAYED PAYMENTS ON DONOR FUNDED ROAD PROJECTS IN GHANA

2.1 INTRODUCTION

Road transport sector is very important to the Ghanaian economy (Ghana Investment Promotion Centre, GIPC). It has been estimated that road transport accounts for 94% of freight ton-miles and about 97% of passenger miles in the country.[10] It is because of the critical role played by road transportation that the Government of Ghana (GOG) has and continue to invest heavily in this sector.

Most of Ghana's road projects are partly or wholly funded with donor funds. In the Case Study of Road Funds in Ghana, Malawi and Tanzania, it was reported that, overall GOG road sector funding from 1996 to 2001 was US$ 1,121.00 million. Donor Funding represent about 44%, which is US$ 496.00 million. (Andreski, 2008)

Government of Ghana in an effort to utilise effectively these donor funds, procure experienced consultants and contractors to execute these projects according to specification and within a specified period. GOG, Donor Agency, Consultant and the Contractor therefore become parties to the contract.

2.2 DONOR FUNDED PROJECT

Ghana's capital-intensive projects such as Roads, Bridges, etc, which are partly or wholly financed with donor funds are termed Donor Funded Project. This is so because the revenue generated in the country is not enough for some to be used for these projects. These funds come in the form of Loans and Grants from Bilateral and Multilateral Donor Agencies such as:

1. IDA - International Development Association (World Bank)
2. AfDB - Africa Development Bank
3. OECF-Overseas Economic Co-operation Fund of Japan
4. EU-European Union
5. KFW- Kreditanstalt fur Wiederaufbau (Bank for Reconstruction)
6. ECGD-Export Credit Guarantee Department of UK
7. JICA-Japan International Co-operation Agency
8. BADEA- Arab Bank for Development in Africa
9. OPEC- Organisation of Petroleum Exporting Countries
10. DANIDA-Danish Goverment
11. Saudi Fund

(Ministry of Transportation, 2009)

2.3 DEFINITION OF DELAYED PAYMENT

In the event that the Interim Payment Certificate (IPC) is not paid within the contractual stipulated time, then delay is said to have occurred and the contractor is entitled to receive interest on the total amount that was delayed in payment. The total amount of interest accrued as a result of the days delayed in payment represents the delayed payment entitled by the contractor.

2.4 INTEREST, ITS LEGAL BASES, AND GENERAL COMPUTATION

Clause 14.8 of FIDIC (2006) states inter alia that, "if the Contractor does not receive payment in accordance with Sub-Clause 14.7 [*Payment*], the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. ....." . This additional payment, workout from the certified amount, is the interest which the contractor is entitled as a result of the delay in payment.

Two formulas have been put into use in the computation of the interest compounded monthly. These are:

1. (P x T x R)/365 and
2. $P[(1+r/1200)^{n/30} - 1]$.

With the formula (P x T x R)/365, "P" represents the certified value, "T" the number of days delayed in payment, and "R" the rate of interest for a particular month. This is calculated for the particular month and the interest added to the certified amount for

recalculation of new interest for the following month. This is done until the number of days of delay is exhausted. The various calculated interest are then added to result in the compounded interest payment for the contractor.

With this second formula $P[(1+r/1200)^{n/30} - 1]$, "P" represents the certified value, "n" the number of days delayed in payment, and "r" the rate of interest for a particular month. This is also calculated for the particular month and the interest added to the certified amount for recalculation of new interest for the following month. This is done until the number of days of delay is exhausted. The various calculated interest are then added to result in the compounded interest payment for the contractor.

2.5 EFFECTS OF DELAYS IN HONOURING PAYMENT CERTIFICATE

Delays in honouring payment certificates by GOG results in additional cost in terms of interest payment, increase in cost of capital to the contractor and delay in completion of projects, which subsequently leads to loss of revenue generation from tolls. This was confirmed to some extend by Oppong (2003) on "Causes of Construction Delays in Ghana".

Oppong Ben (2003) found that delay in payment to contractors for work done rank number one as significant factor causing delays in construction projects. This was from responses from Clients, Contractors and Consultants.

The survey indicated that respondents listed the following as the effects of delays on construction projects[16]:

1. Cost of capital increase;
2. Final cost increase;
3. Loss of revenue.

These effects as listed above could be significantly attributed to delay in payment certificates.

To the contractor working in unstable economy like Ghana, when payment is delayed, the value of the payment is eroded.[16] This negatively affects the cash flow of the contractor and subsequently leads to either delay or suspension of the project.

To the client, the use of the facility or project will be delayed and revenue generation from the project will be lost as well. Cost of capital will also eventually increase as start date for repayment of credit facilities will be delayed. [16]

Non-completion of projects in certain areas of the country, as a result of delay, makes electorate in the area to feel that the incumbent government is insensitive to their needs, and this could affect the credibility of an incumbent government.[16]

Development of Ghana can be negatively affected anytime there is a change of government since priorities may change and the projects the previous government was

undertaking might not be high priority of the current. Donors may also withdraw support when there is consistent delay in the implementation of the project.[16]

2.6 FIGHT AGAINST THE PROBLEM OF DELAYED PAYMENT

The negative effects of delay in honouring payment certificate on contractors prompted the Association of Road Contractors (ASROC) Ghana, to secure grant from Business Sector Advocacy Challenge (BUSAC) Fund (a Non-Governmental organisation operating in Ghana), to finance a joint Advocacy programme to mitigate delays in the payment of road projects executed by private road contractors. (ASROC 2008)

Mr. J. Twumasi-Mensah, the national Chairman of ASROC, stated in his address, during the launch of the Advocacy programme in May 2008 held at Kumasi, that for several years indigenous Ghanaian Road Contractors have not been happy with the long system of payments to contractors in respect of road projects executed by them. He said the system, which involves over 37 processes, constitute one of the problem areas in the operations of Road Contractors.[3]

According to Mr. J. Twumasi-Mensah, ASROC arrived at the 37 processes of payment, following a study, commissioned in 2004, by ASROC and GTZ (The German Technical Corporation), of the procedure for payment by Road Agencies for Works Executed by Road Contractors.[3]

Mr. J. Twumasi-Mensah said, "though the finding of the study were communicated to the Ministry of Transportation and the relevant Road Agencies, it is unfortunate that, the system did not change, it even worsened to the detriment of contractors".[3] This indicate that although private sector has been able to find some factors that affects this delay in payment, bureaucrats and Government appointees in the ministry have not been able, since 2004, to solve the problem.

According to Mr. J. Twumasi-Mensah, even whenever funds becomes available to pay contractors, the long processes alone are more than enough to cause further delays before contractors are paid. He said many Road contractors are owed several millions of Ghana Cedis.[3]

In an effort to curtail this long processes, ASROC has signed a contract for a Grant of GH¢ 46,423 (ASROC contribution to the grant is 10%, while BUSAC's contribution is 90%) to fund an initiative to reduce the 37 processes of payment certificates of road contractors to the barest minimum in order to mitigate delays in payments and completion of road projects.[3] This effort by ASROC clearly shows how frustrated contractors are due to delay in payment certificates.

2.7 PAYMENT OBLIGATION BY G.O.G/DONOR AGENCY IN FIDIC CONDITIONS OF CONTRACT FOR CONSTRUCTION (MARCH 2006)

FIDIC Conditions of Contract has been applied worldwide, especially on projects funded by Donor Agencies such as, World Bank, Asia Development Bank, Africa Development Bank etc. (Dr Miroslaw J. Skibniewski, et al. 2007). Road projects in Ghana, funded by donor agencies, have FIDIC Conditions of Contract incorporated in the Contract Document.

FIDIC (March 2006) condition of contract has clauses, which help the contractors to claim interest on delayed payments. Clause 14.7 b and c states that "the Employer shall pay to the contractor the amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents; or, at a time when the Bank's loans or credit (from which part of the payments to the contractor is being made) is suspended, the amount shown on any statement submitted by the contractor within 14 days after such statement is submitted, any discrepancy being rectified in the next payment to the contractor; and the amount certified in the Final Payment Certificate within 56 days after the Employer receives this payment certificate; or, at a time when the Bank's loan or credit (from which part of the payments to the contractor is being made) is suspended, the undisputed amount shown in the Final Statement within 56 days after the date of notification of the suspension in accordance with sub-Clause 16.2 [*Termination by Contractor*]''

If the Employer (GOG) fails to comply with the above clause, FIDIC Clause 14.8 makes provision for the contractor to claim interest on delayed payment. This Clause 14.8 states, "if the Contractor does not receive payment in accordance with Sub-Clause 14.7 [*Payment*], the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7[*Payment*], irrespective (in the case of its sub-paragraph (b)) of the date on which any Interim Payment Certificate is issued. Unless otherwise stated in the Particular Conditions, these financing charges shall be calculated at the annual rate of three percentage points above the discount rate of the central bank in the country of the currency of payment, or if not available, the interbank offered rate, and shall be paid in such currency. The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy''

The above Clauses in the FIDIC Conditions of Contract, reduce devaluation of contractor's delayed payment.

2.8 COST OF CAPITAL INCURRED BY CONTRACTOR

In many instances, the contractor is not paid within the contractually specified period and this increases significantly the cost of capital of the Contractor.

In the case of local currency (Ghana Cedi), although interest is paid, the rate used is, in some instances, less than the Base Rate of Banks in the country and this leads to cost of

capital to the Contractor who has taken a loan from a Bank or Banks to support the project.

For instance in the contract document of "Oforikrom-Asokwa By pass and Lake Road Improvement" (April 2008), the "rate of interest upon unpaid sums" is "The Bank of Ghana lending rate plus one percent (1%) per annum". This makes the rate for payment of interest on the local currency 19.50% since the prime rate of Bank of Ghana, as at November 6, 2009 was 18.5% (Bank of Ghana, November 6, 2009). The minimum Bank Base Rate in Ghana as at November 6, 2009 was 24.10% (Business Ghana November 6, 2009). This indicates a significant cost of capital the Contractor will incur if payment of certificate delays.

2.9 COST INCURRED BY EMPLOYER (GOG)

The Employer, Government of Ghana (GOG), also incurs additional cost to the project since it has to bear interest on delayed payment.

For instance GOG had to bear € 570,168.66 on interest on delayed payment alone on the project, "Road Rehabilitation and Traffic Management Works in Tema and Sekondi-Takoradi". This represents 3.29% of the contract sum (Final Certificate March 2007). Also GH¢ 145,223.02 and € 59,939.68 were spent on interest on delay payment on the "Abuakwa-Bibiani Road Project" which also represent 1.64% of the contract sum (Final Certificate November 2008). These additional cost incurred could have been avoided if

measures had been put in place to mitigate variables affecting delay in payment certificates.

These variables could be due to client's cash flow problems, late preparation of interim valuation, inaccurate bills of quantities, etc.

2.10 TERMINATION BY CONTRACTOR

FIDIC (March 2006) make provision for the contractor to terminate the contract and be paid on Termination "the amount of any loss or damage sustained by the Contractor as a result of this termination". Clause 16.4 (c)

Clause 16.2 Termination by contractor section (c) states that "The Contractor shall be entitled to terminate the contract if: the Contractor does not receive the amount due under an Interim Payment Certificate within 42 days after the expiry of the time stated in Sub-Clause 14.7[*Payment*] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [Employer's Claims]". This Clause makes it imperative for GOG to attach more seriousness to payment of certificates. Failure to abide by this provision can result in disastrous consequences for the client (GOG).

2.11 BUREAUCRACY IN THE CIVIL SERVICE

Bureaucracy is the collective organizational structure, procedures, protocols, and set of regulations in place to manage activity, usually in large organizations and government.

As opposed to adhocracy, it is represented by standardized procedure (rule-following) that guides the execution of most or all processes within the body; formal division of powers; hierarchy; and relationships, intended to anticipate needs and improve efficiency. (Wikipedia, the free encyclopaedia)

The term Civil Service on the other hand has two distinct meanings: [23]

- A branch of governmental service in which individuals are employed on the basis of professional merit as proven by competitive examinations. [23]
- The body of employees in any government agency other than the military.[23]

A Civil Servant or Public Service is a civilian public sector employee working for a government department or agency.[23] The working attitude of these civil servants may affect the honouring of payment certificates as deduced by Price and Lokko.

In her paper, "Understanding Motivations of Ghanaian Bureaucrats: Examining Expectations of Significant Others", which was a subset of her dissertation project, Lokko, Christine (2007) stated that "Public institutions in Ghana are unable to function as effectively as they should because fifty years after independence, the socio-cultural environment in which they find themselves continues to hamper their full integration. Certainly, Ghanaian society has undergone transformation over the past four decades but it remains a communal society where members of the extended family have expectations of their relatively more well-to-do members. This will continue to be so for as long as high unemployment, low wages and other signs of poverty ravish the citizenry. The lucky ones that are able to improve their socio economic status owe it to the rest of the family

to share their fortune. An African proverb states that "it takes a village to raise a child". Consequently, it is only fair that the child show his or her gratitude to the village when fortune knocks on his or her door".

This communal society, that Ghanaians find themselves as noted above, may make the civil servant to find ways and means to supplement his income in order to support the rest of the family. These may lead the Civil Servant not to attach urgency and seriousness to a work that has no additional monetary reward from the client.

Her study borrows extensively from Price (1975) who studied bureaucratic behaviour in a transitional society.[13] In his thesis, Price said that public bureaucracy in Ghana lacked the two behavioural requirements of organizational effectiveness i.e. "dependable role performance" and "spontaneous behaviour", because of the mode in which the bureaucracy was institutionalized and also because the socio-cultural environment into which the bureaucracy was transferred hampered integration (Price 1975, 24).[13]

Price defined "dependable role performance" as the ability and willingness of public personnel to carry out their assigned roles at some minimal level of quantity and quality. "Spontaneous behaviour" refers to the presence of some level of innovativeness that motivates the employee to want to perform above and beyond the routine and mundane tasks assigned to him/her and spurs employee to take initiative. [13] Price argued that national institutions such as the legislature and administrative agencies have not functioned effectively in developing countries because these institutions are exogenous to

these societies. They were introduced into these societies as a result of their colonial inheritance to "fulfill similar functional needs" (Price 1975, 24). [13]

Price noted however that these institutions developed in their host countries as results of extensive periods of social and cultural change, a fact that is corroborated by Galambos (1987), Skowronek (1982) and Morone (1998).[13]

Rose (1993) indicated that transporting institutions, policies etc, into new settings, in response to similar functional needs did not guarantee that these institutions would perform equally effectively. [13] According to Rose, the borrowing country needed to possess certain characteristics: [13]

a) It had to share cultural similarities with the host country,

b) It had to have a similar level of technical expertise and

c) It must have comparable financial resources.

Price identified cultural differences between the advanced and developing world which can make the latter inhospitable to institutions from the industrialized world.[13] Price argued that advanced countries possess an individualistic culture as contrasted with the communal culture of the receiving nations.

Price explained that African societies are not oriented to rules in the manner that Western societies are. [13] He said Public servants in Ghana and other developing nations acted in particularistic fashions, behaviors that contradict formal rules of bureaucratic practice. [13] According to Price such societies are communal, unlike advanced industrialized countries

that tend to be more individualistic. Family members in these societies have expectations of public servants that the latter tends to fulfill for fear of repercussions from the former. He aptly captured the nature of familial relations in Ghanaian society in the passage below: - "individuals in these societies are viewed as extensions of their corporate groups to the extent that they have no autonomous existence and identity outside their group membership… Relations of a bureaucratic official therefore tend to appropriate any bureaucratic positions held by their relative. …not only will the bureaucrat be expected to behave in the correct particularistic fashion when he encounters a member of his extended kinship group in the bureaucratic setting but in general will be expected to use his office in a manner that will enhance the wealth, status and influence of his group…To refuse demands of this type by giving precedence to one's identity as a bureaucrat and one's commitment to the universalistic norms of the bureaucratic role would be tantamount to defining oneself as outside the corporate group. As a result, the bureaucracy in Ghana was institutionalized in status but not in role (Price 1975, 38)".[13]

Price measured the extent of corruption in the activities of public servants in Ghana. He differentiated bureaucratic corruption from the forms of particularism discussed so far. He defined particularism as instances when formal rules are violated because of a direct or indirect social tie between a public bureaucrat and some individual or group. Corruption is defined by Price as the situation "when universalistic standards are violated because of considerations of monetary gain on the part of the civil servant" (Price 1975, 148). Price added that the socio-cultural system of Ghana creates a receptive environment for corruption. This is because the expectations placed on public servants by their

significant others are so high that the former is unable to meet those needs and therefore, the public servant is forced to supplement the meagre income through corrupt means. Price argued that this phenomenon is partly a result of the colonial legacy seeing that the Europeans that occupied positions in the organization had exalted status as a result of holding those positions. Indigenes that acquired posts in the civil service were obliged to maintain an appearance of a European lifestyle, which also meant that they had greater financial/material obligations to their extended families. The expense burden on the bureaucrat compelled him to find supporting sources of income in order to "keep up with the Jones". [13]

In sum, the colonial legacy, coupled with society's lack of service orientation, and individuals willing to offer financial rewards for services creates an environment conducive for bureaucratic corruption. Price hypothesized that at the individual level, bureaucrats that engaged in corrupt practices in order to satisfy demands from the significant others will be socially rewarded. To test this hypothesis, characteristics of two men were described to respondents who were asked to choose which of the two they thought was a better man. 1. Official One: He has used his official position to "chop" a great deal of money, but he has shown great generosity, coming to the aid of any of his people who are in need. 2. Official Two: He follows all rules and regulations of his office and has not "chopped" money, but as a result, although he would like to show generosity, he constantly refuses to help any of his people who are in need. Price found that a majority (83%) of literate respondents felt that most Ghanaians would think the corrupt official was the better man. A majority of the non-literate respondents also believed that

most Ghanaians would feel that the corrupt official is the better of the two men described.[13]

The above studies done by Price and corroborated to an extent by Lokko give idea about the behaviour and attitude of Public and Civil Servant towards work. The "Chopping" as seen by Price shows that if a certificate gets to official to be processed for payment, the urgency that should be attached to it may be minimal if "Chopping" is not forthcoming from the Contractor and this would cause delay in honouring payment certificate.

2.12 FACTORS AFFECTING CONSTRUCTION DELAYS

Aibinu A.A and Odeyinka H.A. (2006), in accessing construction delays and their causative factors in Nigeria, state among other factors that client's and consultant's variation orders, client's cash flow problems, client's slow decision making, slow response by consultants, delay in work approval, delays due to test and inspection, poor contract management, late preparation of interim valuation, late valuation of variation works, poor information dissemination contribute to delay in construction.

Lo, Y.T, et al (2006) also in accessing construction delays in Hong Kong civil engineering projects state among other factors that inaccurate bills of quantities, slow coordination and seeking of approval from concern authorities, lack of communication, personality clash between contractor agent and resident engineer, and lack of skilled technical personnel contribute to delay in construction.

These variables, as stated above, will be accessed through survey to determine whether they affect delayed payment on donor funded road projects in Ghana.

2.13 PREVIOUS STUDIES ON FACTORS AFFECTING DELAYED PAYMENT

Teye M.(1990) research on Delays in Honouring Certificate on Construction Project, investigated with reference to Ghana Government Articles of Agreement and Conditions of Contract for Building works (applicable only where quantities form part of the contract) 5th Edition (1976). Her focus was on GOG funded projects with more reference to building projects and stated a number of factors affecting delayed payment. The following were the factors:

1. Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment.
2. Lack of proper feasibility studies into the availability of finance to complete a project.
3. Variations are made on project without taking serious consideration of its financial implication.
4. The number of signatures that must be appended to the documents.
5. Disregard to clauses in the conditions of contract about finances by the client.

Gyebi-Ababio, K (2003) also researched on causes and effect of delayed payment to contractors (a case study of Ashanti Region). His focus was also on GOG funded projects and he stated the following factors as affecting delayed payments:

1. Inability to provide funds, due to poor budgetary allocation and mismanagement of funds
2. Bureaucratic bottleneck, due to signatories to certificate
3 Late preparation of certificates
4 Late commencement of work
5 Poor planning and inadequate feasibility studies.
6 Shear disregard to the conditions of contract and articles of agreement regarding payment to contractors.
7 Political leanings of the directors of the company

All the stated above factors will also be accessed through survey to determine whether they affect delayed payment of donor funded road projects in Ghana.

2.14 SUMMARY OF VARIABLES AFFECTING DELAYED PAYMENT ON DONOR FUNDED ROAD PROJECTS IN GHANA TO BE INVESTIGATED

Variables affecting delayed payment on donor funded road projects in Ghana, identified from literature, to be investigated are:

1. Variations/Changes in scope
2. Client's slow decision making
3. Client's cash flow problems (Counterpart Funds)
4. Lack of proper feasibility studies into the availability of finance to complete a Project
5 The number of signatories that must append to the certificate
6 Sheer disregard for the conditions of contract regarding payment
7 Late preparation of interim valuation
8 Late valuation of variations
9 Inaccurate bills of quantities
10 Slow coordination and seeking of approval from concerned authorities
11 Delay in work approval
12 Poor information dissemination
13 Lack of communication
14 Personality clash between contractor Agent and Resident Engineer
15 Test and inspection of works
16 Poor contract management

17 Lack of skilled technical personnel

18 Liaison problems among the contracting parties

19 Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment.

20 Political leanings of the directors of the company

REFERENCES

1 Aibinu, A.A and Odeyinka, H. A. (2006), Construction Delays and Their Causative Factors in Nigeria, Journal of Construction Engineering and Management © ASCE/July 2006

2 Andreski,Adam(2008), Case Study of Road Funds in Ghana, Malawi and Tanzania. background paper to Module 1, Senior Road Executive Course, University of Birmingham: http://www.gtkp.com/sectors.asp?step=4&typeOFPage=0&contentID=2938 Accessed 10th November 2009.

3 Association of Road Contractors (ASROC) (2008), ASROC Gets BUSAC Grant to Fight the Problem of Delayed Payments, http://www. *asrocghana.org/**asroc**/modules/news/makepdf.php?storyid=15* Accessed 5th November 2009.

4 BI/ABP Consult Ltd, (Final Certificate March 2007), Road Rehabilitation and Traffic Management Works in Tema and Sekondi-Takoradi Department of Urban Roads, Ministry of Transportation.

5 Bank of Ghana (November 2009), http://www.bog.gov.gh/ Accessed 7th November 2009

6 BusinessGhana (November 2009),

http://www.businessghana.com/portal/finance/index.php?op=getBankRates

Accessed 7th November 2009

7 Dr Miroslaw J. Skibniewski, A.J Clark Chair Professor(2007), Introduction to FIDIC Conditions of Contract

http://www1.fidic.org/resourses/contract/skibniewski07.pdf

Accessed 6th November, 2009.

8 Federation Internationale Des Ingenieurs-Conseils (FIDIC) Conditions of Contract for Construction: For Building and Engineering Works Designed By the Employer.

Multilateral Development Bank Harmonised Edition March 2006

http://217.197.210.21/resources/contracts/mdb/ Accessed 10th November 2009.

9 Galambos, Louis. (1987), The New American State. Baltimore: Johns Hopkins University Press.

10 Ghana Investment Promotion Centre, (GIPC):

http://www.gipc.org.gh/Pages.aspx?id=81 Accessed 4th November 2009.

11 Gyebi-Ababio, K (2003), "Causes and Effects of Delayed Payments to Contractors (A Case Study of Ashanti Region) ,'' Department of Building Technology, Kwame Nkrumah University of Science and Technology. (Unpublished thesis)

12 Lo T.Y, et al (2006), Construction Delays IN Hong Kong Civil Engineering Projects, Journal of Construction Engineering and Management © ASCE/June 2006

13 Lokko Christine (2007), Understanding Motivations of Ghanaian Bureaucrats: Examining Expectations of Significant Others http://www.allacademic.com//meta/p_mla_apa_research_citation/1/7/6/4/8/pages17648 Accessed 4th November 2009.

14 Ministry of Roads and Transport (November 2009), http://www.mrt.gov.gh/subsite.asp?page_id=25&ss_id=7 Accessed 4th November 2009

15 Morone, James A. (1998), The Democratic Wish. New Haven: Yale University Press.

16 Oppong Ben (2003), Causes of Construction Delays in Ghana, Department of Building Technology, Kwame Nkrumah University of Science and Technology (Unpublished Thesis)

17 Parsons, Talcott, and Edward Shils, eds. (1951), Toward A General Theory Of Action. New York: Harper & Row, 1951

18 Price, Robert M. (1975), Society and Bureaucracy in Contemporary Ghana. Berkeley: University of California Press.

19 Rose, Richard. (1993), Lesson-Drawing in Public Policy: A Guide to Learning Across Time and Space. (Chatham NJ: Chatham House, 1993).

20 Scetauroute International & Associated Consultants, (Final Certificate November 2008), Abuakwa-Bibiani Road Project, Ghana Highway Authority.

21 Skowronek, Stephen (1982), Building a New American State: The Expansion of National Administrative Capacities, 1877–1920. Cambridge: Cambridge University Press.

22 Teye M (1990), "Delays in Honouring of Certificate onConstruction Projects,'' Department of Building Technology, Kwame Nkrumah University of Science and Technology. (Unpublished thesis)

23 Wikipedia, the free encyclopaedia,

a http://en.wikipedia.org/wiki/Bureaucracy Accessed 10th November 2009.

b http://en.wikipedia.org/wiki/Civil_service Accessed 4th November 2009.

CHAPTER THREE

RESEARCH METHODOLOGY AND DATA COLLECTION

3.1 RESEARCH APPROACH

This research took the form of integrative review and a survey using questionnaire and interviews.

Integrative review: this "summarizes past research and draws overall conclusions from the body of literature on a particular topic. The body of literature comprises all studies that address related or identical hypotheses". (Beyea S. 1998)

This research took the integrative review approach since this suited the aim and the objectives.

To determine the methodology of the research, the fundamental question must be defined in order to plan logical steps from which conclusions could be drawn. The major question the research seeks to explore is:

- What are the factors that affect delayed payment of certificates for donor funded road projects in Ghana?

The research seeks to find the significant factors that cause delay in honouring payment certificate and to find ways that if implemented by authorities, will reduce the delays and their effects on Ghana's economy. It also seeks to find any discrimination among Donor

Agencies, Government Establishments, Civil Works Consultants, and Road Contractors in assessing the factors affecting delay in honouring payment certificate.

The research was carried out in three phases as follows:

1. A literature search from journal, web sites and books was undertaken to ascertain the general knowledge of the project topic.
2. Questionnaire was designed and sent to Donor Agencies, Civil Works Consultants, Road Contractors and Government establishments such as Ministry of Finance and Economic Planning, Regional Coordinating Councils, Ministry of Roads and Highways, Department of Feeder Roads, Department of Urban Roads, and Ghana Highways Authority. This was to seek their opinion on the factors that affect delays in honouring payment certificates.
3. The results of the questionnaire was analysed using the Relative Important Index and Kendall's concordance analysis to determine the ranking of the variables affecting the delays in payment certificates, and establish degree of agreement among Public Servants/Civil Servants, Civil Works Consultants, Donor Agencies and Road Contractors on the variables affecting the delays in payment certificates. The significant variables affecting the delays in payment certificate were identified using the SPSS's (Statistical Package for the Social Sciences) Chi-Square at 95% confidence interval.

3.2 DATA COLLECTION

The primary source of data collection for this research was in the form of structured questionnaires and interviews which was administered to Public Servants/Civil Servants in road sector establishments, Civil Works Consultants, Donor Agencies and Road Contractors (A1B1 to A4B4). This was done to collect information on factors affecting delays in honouring payment certificates.

3.2.1 Questionnaire Development

The questionnaire was developed in accordance with the objectives of the research which was to identify the significant factors that cause the delays in honouring the payment certificates on donor funded road projects in Ghana.

The questionnaire was organised in two parts. The first part contained questions that seek to identify the establishment and level of experience of the respondents.

The second part seeks to solicit the respondent's views on factors that affect delays in honouring payment certificates on donor funded road projects in Ghana.

In his paper "Hints for designing effective questionnaire", Frary, R. B. (1996) said "Psychometric research has shown that most subjects cannot reliably distinguish more than six or seven levels of response. Offering four to five scale points is usually quite sufficient to stimulate a reasonably reliable indication of response direction".

In line with Frary's comment, respondents were asked to rank the factors affecting delay in honouring payment certificates for donor funded road projects using a scale of 1-5.

5- Very High, 4-High, 3-Medium, 2- Low, 1-Very Low

3.2.2 Sampling Technique

The questionnaires were sent to selected Government establishments, and randomly selected Civil Works Consultants, Donor Agencies and Road Contractors.

The Government establishments were bodies that implement road projects in the country. These were made up of Ministry of Finance and Economic Planning, randomly selected Regional Coordinating Councils, Ministry of Roads and Highways, Department of Feeder Roads, Department of Urban Roads and Ghana Highways Authority.

The Road Contractors and Donor Agencies were selected from Ministry of Roads and Highways, and Civil Works Consultants from Ghana Institution of Engineers

Statistical method was used in establishing the sample size for Donor Agencies, Civil Works Consultants and Road Contractors for the study. The sample size was determined using the Kish (1965) statistical formula as stated below:

$$n = \frac{n^1}{(1+n^1/N)}$$

Where:

n	=	Sample Size
n^1	=	$\frac{S^2}{V^2}$
N	=	Population Size
S	=	Maximum standard deviation in the population element (Total error = 0.1at a confidence level of 95%)
V	=	Standard error of sampling distribution = 0.05
P	=	The proportion of the population elements that belong to the defined class.
S^2	=	P (1-P) = 0.5(1-0.5) = 0.25

3.2.2.1 Sample size for Donor Agencies

$$n = \frac{n^1}{(1+n^1/N)}$$

N = 11 (Ministry of Roads and Highways, 2009)

$$n^1 = \frac{0.25}{0.05^2} = 100$$

n = 100/ (1+ (100/11)) = 9.90991=10

The program officer and the Accountant were sent the questionnaires since they deal with the certificate processes. This gives a total of twenty (20) questionnaires to these agencies.(i.e. 2No.personels x10=20)

3.2.2.2 Sample size for Civil Works Consultants

N = 35 (Ghana Institution of Engineers, as at December 2009)

n = 100/ (1+ (100/35)) = 25.93=26

The Quantity Surveyor, the Resident Engineer and Resident Deputy Engineer were sent the questionnaires since they deal with the certificate processes. This gives a total of seventy-eight (78) questionnaires to these Civil Works Consultants.

(i.e. 3No.personels x 26= 78)

3.2.2.3 Sample size for Road Contractors (Class A1B1 to A4B4)

The Ministry of Roads and Highways list a total of 1,098 registered A1B1 to A4B4 road contractors in good standing as at December 2009. Oppong B (2003) made reference to Osei T. (1993) studies that show that "about 10% of registered contractors are actively engaged in construction work at any time". On these bases it could be assume that out of the 1,098 registered A1B1 to A4B4 road contractors, only about 110 are actively involved in road construction.

N = 110

n = 100/ (1+ (100/110)) = 52.38=52

The Project Manager/Engineer and the Quantity Surveyor were sent the questionnaires since they deal with the certificate processes. This gives a total of hundred and four (104) questionnaires sent to these Road Contractors. (i.e. 2No.personels x 52=104)

3.2.2.4 Sample size for Regional Coordinating Council(RCC)

N = 10

n = 100/ (1+ (100/10)) = 9.09= 9

The Director, Deputy Director, and the Economic Planning Officer were sent the questionnaires since they deal with the certificate processes. This gives a total of twenty seven (27) questionnaires to the Regional Coordinating Councils

(i.e.3No.personels x 9=27)

3.2.2.5 Sample size for Ministry of Road and Highways and Ministry of Finance and Economic planning

The following personnel in these ministries above were given the questionnaires:

- The Director/Deputy Director,
- Head of Monitoring and Evaluation
- Sector Head of donor funding

This gives a total of six (6) questionnaires sent to the above Ministries.

(i.e. 3No.personels x 2Ministries= 6)

3.2.2.6 Sample size for Highway Authority, Department of Urban Roads and Department of Feeder Roads

N = 30 i.e. 10 x 3 (Ten (10) Regions for each establishment)

n= 100 / (1+ (100/30)) = 23.08= 23

The following personnel in these government establishments above were given the questionnaires:

- The CEO/Director
- Deputy CEO/Deputy Director,
- Director of Quantities/Contract Manager/Regional Quantity Surveyor

This gives a total of sixty-nine (69) questionnaires sent to the above government establishments.

(i.e. 3No.personels x 23= 69)

Table 3.1: Sample size for each of the selected Establishment

Establishments	**Minimum sample size**	**Number of Questionnaires Allotted**
Donor Agencies	10	20
Civil Works Consultants	26	78
Road Contractors (Class A1B1 to A4B4)	52	104
Regional Coordinating Councils	9	27
Ministry of Roads and Highways and Ministry of Finance and Economic planning	2	6
Ghana Highway Authority, Department of Urban Roads and Department of Feeder Roads	23	69
Total	**122**	**304**

3.3 ANALYSIS OF THE DATA

3.3.1 Determination of the Significance of the Variables

Statistical Package for Social Sciences (SPSS.16) was used to analyse the twenty (20) variables to determine their significance using Chi-Squared Test (χ^2) at 95% confidence interval.

3.3.2 Exploratory Factor Analysis (Principal Component Analysis)

Factor analysis is a statistical method used to condense the information contained in a number of original variables into a smaller set of dimensions (factors) with a minimum loss of information (Hair et al., 1992), cited in (DeCoster, 1998). With relatively large number of variables involved in this study, it is possible that some of the variables are measuring aspect of the same underlying effect. Exploratory Factor Analysis was therefore used for data reduction to establish which of the variables could be measuring aspects of the same underlying dimensions (factors).

3.3.3 Relative Important Index (RII)

The reduced variables, forming four (4) components factors, affecting delay in payment certificate was analyzed using relative important index computed by the formula:

$$\mathbf{RII} = \left\{ \frac{\mathbf{5n5 + 4n4 + 3n3 + 2n2 + 1n1}}{\mathbf{5(n1 + n2 + n3 + n4 + n5)}} \right\} \mathbf{x\ 100}$$

Where RII = Relative Important Index

n1= Number of respondent who answered " Very Low"

n2= Number of respondent who answered " Low"

n3= Number of respondent who answered " Medium"

n4= Number of respondent who answered " High"

n5= Number of respondent who answered " Very High"

Based on the important indices, the variables were ranked and the agreement among the establishments was determined by the use of the Kendall's concordance analysis and Chi-Square.

3.3.4 Kendall's Concordance Co-efficient and Observed Chi-Square Value

The Kendall's concordance co-efficient measures the degree of agreement among sets of ranking. This is given as: $W = \frac{S}{\frac{1}{12}k^2\left(n^3 - n\right)}$ and must be between 0 and 1,

Where:

$S = \sum (SR)^2 - n\left(\overline{SR}\right)^2$

k = Groups (columns) with n items in each

SR_i = Sum of Ranks for each Row

Mean of the SR_i s = $\overline{SR} = \frac{(n+1)k}{2}$

Observed Chi-Square Calculation formula = $\chi^{2(n-1)} = k(n-1)W$

A high value of W indicates a high degree of agreement among the set of rankings.

3.3.5 Hypothesis testing [Chi-Squared Test (χ^2)]

Testing the significance of W at the $\alpha = 0.05$ (5%) level of significance.

H_0: the set of rankings by Public/ Civil Servants, Donor Agencies, Consultants and Contractors are independent/ unrelated (Do not Agree).

H_1: the set of rankings by Public/ Civil Servants, Donor Agencies, Consultants and Contractors are related (Do Agree).

A significant level of $\alpha = 0.05$ was used.

We reject H_0 and accept H_1 if $X^2_{cal} > X^2_{table}$ where X^2_{cal} is the calculated Chi-Squared value and X^2_{table} is the Chi-Squared value read from the Chi-Squared distribution table.

If $X^2_{cal} < X^2_{table}$, We accept H_0 and reject H_1

REFERENCES

1. Beyea S. and Nichll, L. H (1998), Writing an Integrative review, AORN Journal April , 1998
   http://findarticles.com/p/articles/mi_m0FSL/is_n4_v67/ai_20972821/
   Accessed 21st January, 2010

2. Frary, R. B. (1996), Hints for designing effective questionnaires. Practical Assessment Research& Evaluation
   http://pareonline.net/getvn.asp?v=5&n=3
   Accessed 21st January, 2010

3. Kish, L (1965), Survey Sampling, John Wiley and Sons Inc, New York.

4 Oppong Ben (2003), Causes of Construction Delays in Ghana, Department of Building Technology, Kwame Nkrumah University of Science and Technology (Unpublished Thesis)

5 Osei-Tutu, E .(1993), Situation Analysis of Domestic Construction Industry in Ghana with Special Reference to Organisation and Management of Construction (The Surveyor pp 30-35 January 1998)

CHAPTER FOUR

SURVEY RESULTS, ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

Statistical methods of analysis were employed for the analysis of the Factors Affecting Delayed Payment on Donor Funded Road Projects in Ghana. These methods were:

1. Statistical Package for Social Sciences (SPSS.16) Chi-Squared Test (χ^2) - To determine the significance of the variables.
2. Exploratory Factor Analysis (Principal Component Analysis) - for data reduction to establish which of the variables could be measuring aspects of the same underlying dimensions (factors).
3. Relative Importance Index (RII) - To rank the significant variables
4. Kendall's Concordance Coefficient and Chi-Squared Test (χ^2) - To determine agreement among the four(4) groups of respondents

4.2 ANALYSIS OF RESPONSE

A total of three hundred and four (304) questionnaires were sent to the four groups of respondents of which one hundred and thirty (130) were received representing a response rate of 42.76%.

Aibinu A.A. et al (2006), in accessing construction delays and their causative factors in Nigeria, made reference to assertion by Moser and Kalton (1971) that "the result of a survey could be considered as bias and little value if the return rate was lower than 30-

40%". This assertion indicates that the response rate of 42.76% was adequate for the analysis.

Table 4.1 shows details of questionnaires sent to various categories of groups and the rate of return.

Table 4.1: Details of Questionnaires to Various Categories of Groups and Return Rate

	Establishments	Minimum sample size	NO. OF QUESTIONNAIRES DISTRIBUTED	NO. OF QUESTIONNAIRES RETURNED	% RATE OF RETURN
	Donor Agencies	10	20	12	60.00
	Civil Works Consultants	26	78	29	37.18
	Road Contractors (Class A1B1 to A4B4)	52	104	52	50.00
Public Servants/ Civil Servants	Regional Coordinating Councils	9	27	9	33.33
	Ministry of Roads and Highways and Ministry of Finance and Economic Planning	2	6	4	66.67
	Ghana Highway Authority, Department of Urban Roads and Department of Feeder Roads	23	69	24	34.78
	Total	**122**	**304**	**130**	**42.76**

Source: Field Survey, 20TH APRIL – 21ST MAY, 2010

4.3 PERCENTAGE OF RESPONDENTS TO SOME RELEVANT QUESTIONS

The responses received from the four groups indicate that 73.9% of the respondents have more that six (6) years of experience in the construction industry, 78.5% of the respondents have a minimum of Bachelor of Science degree (BSc), 90.6% responded to the fact that they have had a role in processing/ preparation/ issue of payment certificates for road projects, and 93.1% said they were aware that the Government of Ghana (GOG) pays Interest to contractors as a result of delay in honouring payment certificates.

The above information regarding the percentages of the respondents indicates that the responses provided could be relied upon for this study.

Table 4.2: The Detailed Percentage of Respondents to the Question.

	Frequency (N = 130)	Percentage (%)
Construction type		
Public/ Civil servant	37	28.46
Donor Agency	12	9.23
Consultant	29	22.31
Contractor	52	40.0
Educational level		
City and Guilds	8	6.15
HND/ Diploma	20	15.39
BSC/ BA	65	50.00
MSC/ MA	36	27.69
PhD or higher	1	0.77
Years in Constr. Industry		
0-5	34	26.15
6-10	32	24.62
11-20	47	36.15
21 and above	17	13.08

Table 4.3: Summary of Percentage of Respondents to Some of the Relevant Questions

Some Relevant Questions	**Percentage of Respondents**
Years in the Construction Industry more than 6 Years	73.9%
Minimum Qualification of Bsc(Hons)	78.5%
Role in Processing/ Preparing/ Issuing Payment Certificate	90.6%
Aware that G.O.G pays Interest on Delayed Payment	93.1%

4.4 FACTORS AFFECTING DELAYED PAYMENT ON DONOR FUNDED ROAD PROJECTS IN GHANA

The following factors were identified from literature review as variables that could affect delay in payment of certificates of donor funded road projects in Ghana.

F1 Variations/changes in scope

F2 Client's slow decision making

F3 Client's cash flow problems (The counterpart Funds)

F4 Lack of proper feasibility studies into the availability of finance to complete a project

F5 The number of signatories that must append to the certificate

F6 Sheer disregard for the conditions of contract regarding payment

F7 Late preparation of interim valuation

F8 Late valuation of variation

F9 Inaccurate bills of quantities

F10 Slow coordination and seeking of approval from concerned authorities

F11 Delay in work approval

F12 Poor information dissemination

F13 Lack of communication

F14 Personality clash between contractor Agent and Resident Engineer

F15 Test and inspection of works

F16 Poor contract management

F17 Lack of skilled technical personnel

F18 Liaison problems among the contracting parties

F19 Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment

F20 Political leanings of the directors of the company

The respondents were asked to rank the above factors according to their level of importance to determine significant factors affecting delayed payment on Donor funded road projects in Ghana. This was done using a scale of 1- 5. The scale is as follows:

1- Very Low

2- Low

3- Medium

4- High

5- Very High

The responses received from the four groups of respondents are shown in Tables 4.4 - 4.7 below:

Table 4.4: Responses from **Donor Agencies**

FACTORS	PERCENTAGE / FREQUENCY DISTRIBUTION OF RESPONSES					TOTAL
	1	2	3	4	5	
F1	0.0	33.3	33.3	33.3	0.0	100.0
F2	0.0	16.7	66.7	8.3	8.3	100.0
F3	41.7	16.7	0.0	41.7	0.0	100.0
F4	50.0	16.7	16.7	8.3	8.3	100.0
F5	0.0	0.0	41.7	16.7	41.7	100.0
F6	0.0	50.0	0.0	41.7	8.3	100.0
F7	8.3	33.3	25.0	16.7	16.7	100.0
F8	0.0	25.0	33.3	41.7	0.0	100.0
F9	0.0	33.3	33.3	16.7	16.7	100.0
F10	0.0	8.3	41.7	25.0	25.0	100.0
F11	0.0	0.0	41.7	33.3	25.0	100.0
F12	16.7	8.3	8.3	58.3	8.3	100.0
F13	16.7	58.3	16.7	0.0	8.3	100.0
F14	25.0	50.0	16.7	8.3	0.0	100.0
F15	16.7	16.7	50.0	16.7	0.0	100.0
F16	8.3	8.3	33.3	50.0	0.0	100.0
F17	8.3	8.3	83.3	0.0	0.0	100.0
F18	0.0	58.3	33.3	0.0	8.3	100.0
F19	0.0	41.7	8.3	50.0	0.0	100.0
F20	0.0	33.3	25.0	8.3	33.3	100.0

Table 4.5: Responses From **Civil Works Consultants**

FACTORS	PERCENTAGE/ FREQUENCY DISTRIBUTION OF RESPONSES					TOTAL
	1	2	3	4	5	
F1	6.9	10.3	34.5	20.7	27.6	100.0
F2	3.4	20.7	13.8	48.3	13.8	100.0
F3	3.4	10.3	13.8	24.1	48.3	100.0
F4	3.4	24.1	20.7	48.3	3.4	100.0
F5	.0	10.3	27.6	41.4	20.7	100.0
F6	10.3	27.6	34.5	20.7	6.9	100.0
F7	6.9	17.2	37.9	31.0	6.9	100.0
F8	10.3	24.1	34.5	31.0	0.0	100.0
F9	3.4	24.1	37.9	27.6	6.9	100.0
F10	6.9	6.9	20.7	58.6	6.9	100.0
F11	3.4	27.6	37.9	31.0	0.0	100.0
F12	.0	35.7	42.9	17.9	3.6	100.0
F13	3.4	37.9	27.6	24.1	6.9	100.0
F14	20.7	31.0	34.5	6.9	6.9	100.0
F15	17.2	51.7	20.7	10.3	0.0	100.0
F16	3.4	24.1	24.1	37.9	10.3	100.0
F17	10.3	31.0	44.8	13.8	0.0	100.0
F18	6.9	27.6	44.8	17.2	3.4	100.0
F19	10.3	17.2	20.7	41.4	10.3	100.0
F20	10.3	24.1	20.7	27.6	17.2	100.0

Table 4.6: Responses from **Contractors**

FACTORS	PERCENTAGE/ FREQUENCY DISTRIBUTION OF RESPONSES					TOTAL
	1	2	3	4	5	
F1	3.8	25.0	26.9	34.6	9.6	100.0
F2	0.0	23.1	32.7	30.8	13.5	100.0
F3	0.0	13.5	17.3	32.7	36.5	100.0
F4	1.9	21.2	32.7	28.8	15.4	100.0
F5	3.8	9.6	11.5	36.5	38.5	100.0
F6	15.4	7.7	25.0	30.8	21.2	100.0
F7	9.6	21.2	32.7	36.5	0.0	100.0
F8	7.7	17.3	26.9	32.7	15.4	100.0
F9	13.5	28.8	48.1	9.6	0.0	100.0
F10	3.8	15.4	23.1	40.4	17.3	100.0
F11	9.6	9.6	36.5	32.7	11.5	100.0
F12	7.7	42.3	25.0	23.1	1.9	100.0
F13	9.6	25.0	28.8	36.5	0.0	100.0
F14	13.5	38.5	30.8	15.4	1.9	100.0
F15	17.3	23.1	36.5	23.1	0.0	100.0
F16	7.7	25.0	21.2	28.8	17.3	100.0
F17	5.8	44.2	26.9	21.2	1.9	100.0
F18	11.5	25.0	34.6	26.9	1.9	100.0
F19	7.7	19.2	21.2	40.4	11.5	100.0
F20	9.6	11.5	32.7	32.7	13.5	100.0

Table 4.7: Responses From **Public/ Civil Servants**

FACTORS	PERCENTAGE / FREQUENCY DISTRIBUTION OF RESPONSES					TOTAL
	1	2	3	4	5	
F1	13.5	13.5	43.2	27.0	2.7	100.0
F2	21.6	35.1	18.9	18.9	5.4	100.0
F3	5.4	18.9	8.1	35.1	32.4	100.0
F4	10.8	27.0	21.6	21.6	18.9	100.0
F5	10.8	21.6	27.0	18.9	21.6	100.0
F6	21.6	37.8	13.5	21.6	5.4	100.0
F7	8.1	21.6	48.6	18.9	2.7	100.0
F8	8.1	21.6	48.6	18.9	2.7	100.0
F9	16.2	32.4	40.5	8.1	2.7	100.0
F10	2.7	27.0	32.4	32.4	5.4	100.0
F11	8.1	13.5	43.2	32.4	2.7	100.0
F12	18.9	40.5	27.0	13.5	0.0	100.0
F13	8.1	37.8	37.8	16.2	0.0	100.0
F14	18.9	37.8	37.8	5.4	0.0	100.0
F15	8.1	48.6	40.5	2.7	0.0	100.0
F16	8.1	24.3	40.5	27.0	0.0	100.0
F17	32.4	29.7	32.4	2.7	2.7	100.0
F18	16.2	45.9	35.1	2.7	0.0	100.0
F19	13.5	13.5	48.6	21.6	2.7	100.0
F20	13.5	29.7	32.4	18.9	5.4	100.0

4.5 DETERMINATION OF THE SIGNIFICANT VARIABLES

The results as shown in Tables 4.4 to 4.7 were inputted into SPSS and the Chi-Square was used to determine the Asymptomatic Significant (Asymp. Sig.) of all the variables affecting delayed payment of donor funded road projects in Ghana. 95% Confidence Interval was used and variable with Asymp.Sig. value of more than 0.05 was considered not significant. The following table shows the variables and their corresponding Chi-Square and Asymp.Sig. Values. (See Appendix 2 for the SPSS results)

Tables 4.8 below shows the significant variables affecting delayed payment on donor funded road projects in Ghana:

Table 4.8 -Significant Variables Affecting Delayed Payment on Donor Funded Roads Projects in Ghana

	VARIABLES	Chi-Square	Asymp. Sig	Remarks
F1	Variation / changes in scope	34.692	0.000	Significant
F2	Client's slow decision making	27.923	0.000	Significant
F3	Client's cash flow problems (The counterpart Funds)	41.923	0.000	Significant
F4	Lack of proper feasibility studies into the availability of finance to complete a project	18.692	0.001	Significant
F5	The number of signatories that must append to the certificate	33.615	0.000	Significant
F6	Sheer disregard for the conditions of contract regarding payment	10.385	0.034	Significant
F7	Late preparation of interim valuation	50.769	0.000	Significant
F8	Late valuation of variation	41.923	0.000	Significant
F9	Inaccurate bills of quantities	62.846	0.000	Significant
F10	Slow coordination and seeking of approval from concerned authorities	52.923	0.000	Significant
F11	Delay in work approval	57.308	0.000	Significant
F12	Poor information dissemination	50.031	0.000	Significant
F13	Lack of communication	50.769	0.000	Significant
F14	Personality clash between contractor Agent and Resident Engineer	57.385	0.000	Significant
F15	Test and inspection of works	24.154	0.000	Significant
F16	Poor contract management	33.769	0.000	Significant
F17	Lack of skilled technical personnel	60.692	0.000	Significant
F18	Liaison problems among the contracting parties	59.769	0.000	Significant
F19	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	38.231	0.000	Significant
F20	Political leanings of the directors of the company	16.538	0.002	Significant

The above table shows that all the variables under consideration are significant since all the Asymptomatic Significant were below 0.05 at 95% confidence interval.

4.6 Exploratory Factor Analysis (Principal Component Analysis)

Exploratory Factor Analysis was used to establish the Principal Components (factors) of the established significant variables.

4.6.1 Initial Considerations

4.6.1.1 Sample Size

Correlation coefficient fluctuate from sample to sample, therefore the reliability of factor analysis is dependent on the sample size. (Field, 2005). The common rule is to suggest that a researcher should have at least 10-15 participants per variable. (Field, 2005).

4.6.1.2 Communalities

Field (2005) indicated that the study by MacCallum, Widaman, Zhang & Hong (1999) indicated that as communalities become lower the importance of sample size increases. With all communalities above 0.6, relative small samples (less than 100) may be perfectly adequate. Communalities in the 0.5 range, samples between 100 and 200 can be good enough provided there are relatively few factors each with only a small number of indicator variables. Table 4.13 indicate minimum Communalities of 0.54 after six iteration. Hence the sample size of 130 was adequate for the study.

4.6.1.3 Kaiser-Meyer-Olkin Test

SPSS offers Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-test) to check whether the sample is big enough. The sample is adequate if the value of KMO is greater than 0.5. (Kaiser 1974, cited in Field, 2005). The data from the survey for Factors

Affecting Delayed Payment on Donor Funded Roads Projects in Ghana is adequate by this test. The data has 130 observations per variable, with the value of the KMO greater than 0.5 (Table 4.9).

Table 4.9: **KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	707.261
	df	91
	Sig.	.000

The KMO statistic varies between 0 and 1. A value of 0 indicates that the sum of partial correlations is large relative to the sum of correlations, indicating diffusion in the pattern of correlations (hence, factor analysis is likely to be inappropriate). (Field, 2005). A value close to 1 indicates that patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors. (Field, 2005). Hutcheson and Sofroniou (1999), cited in Field (2005), indicated that values between 0.8 and 0.9 are great. The analysis gave a KMO of 0.806; hence factor analysis is appropriate for this study. (See Table 4.9)

4.6.1.4 Bartlett's Test

Bartlett's Test tests the null hypothesis that the original correlation matrix is an identity matrix. (Field, 2005). For factor analysis to work we need some relationships between variables and if the R-matrix were an identity matrix then all correlation coefficients would be zero. (Field, 2005). Therefore, we need this test to be significant (i.e. have a

significance value less than 0.05). (Field, 2005). A significant test tells us that the R-matrix is not an identity matrix; therefore, there are some relationships between the variables we hope to include in the analysis (Field, 2005). Bartlett's Test for this study was highly significant ($p<0.001$), and therefore factor analysis is appropriate. (Field, 2005) (See Table 4.9)

4.6.2 Running Exploratory Factor Analysis

Exploratory Factor Analysis (EPA) was run for dependent variables using the principal component analysis as the extraction method and the varimax criterion as the rotation method. (Cheng and Choy, 2007), and where appropriate, eliminate items that are not factorially pure (Weiss, 1970, cited in Cheng and Choy, 2007). The main objective of using the EFA is to summarize the dependent variables into a new and smaller set of uncorrelated dimensions (i.e., factors affecting delayed payment on donor funded road project in Ghana) with a minimum loss of information (Ngai et al., 2004, cited in Cheng and Choy, 2007). The unidimensionality of each success factor is assessed by examining the factor loadings. Variables with factor loadings greater than 0.50, on the factor that they are hypothesized to load on, are considered adequate variables for that factor. (Hair et al., 1998, cited in Cheng and Choy, 2007). In addition, the use of imprecise and ambiguous terms to label the factors was avoided (Bagozzi, 1981, cited in Cheng and Choy, 2007). The variables in each category were assumed to be measures of the same factor. Variables that are not factorially pure and/or cross-load on multiple factors are deleted (Cheng and Choy, 2007). After extracting the factors by the EFA, reliability assessment was conducted by calculating the Cronbach's α for the extracted factor model

in order to ensure that the variables comprising each success factor are highly reliable and internally consistent (Hair et al., 1998, cited in Cheng and Choy, 2007). If the calculated Cronbach's α is greater than the critical point of 0.70 (Nunnally, 1978, cited in Cheng and Choy, 2007), the proposed success factor is said to be highly reliable and internally consistent.

After six repetition of the EFA, six (6) variables were eliminated and the remaining fourteen (14) dependent variables were organized under four factors. All the factor loadings met the threshold value of 0.50 or above and all the eigenvalues were greater than 1, which explains 66.805% of the variance. The Cronbach's α was **.853** (See Table 4.10, 4.11 and 4.12).

The resultant Determinant, from the analysis, was 0.003 (See Appendix 3) and this indicates that there is no extreme multicollinearity (i.e variables that are very highly correlated) or singularity (i.e variables that are perfectly correlated). (Field, 2005). According to Field, 2005, if the determinant of the R-matrix is greater than 0.00001 then multicollinearity is not a problem.

Table 4.10 **Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.853	.859	14

Table 4.11 **Rotated Component Matrix[a]**

	Component			
	1	2	3	4
Variation /changes in scope	**.733**	-.009	.196	.110
Client's cash flow problems	-.028	.167	**.872**	.081
Lack of proper feasibility studies into the availability of finance to complete a project	.229	.220	**.831**	-.071
The number of signatories that must append to the certificate	.084	-.018	.035	**.902**
Sheer disregard for the conditions of contract regarding payment	.217	.461	.017	**.632**
Late preparation of interim valuation	**.774**	.094	.122	-.022
Late valuation of variation	**.830**	.110	.097	.095
Inaccurate bills of quantities	**.652**	.331	-.100	.070
Slow coordination and seeking of approval from concerned authorities	**.531**	.407	-.086	.408
Delay in work approval	**.612**	.376	-.033	.302
Lack of communication	.298	**.651**	.339	.107
Poor contract management	.377	**.698**	.023	-.175
Liaison problems among the contracting parties	.052	**.825**	.179	.118
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.046	**.674**	.188	.218

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Table 4.12 **Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**5.116**	36.541	36.541	**5.116**	36.541	36.541	3.250	23.212	23.212
2	**1.762**	12.588	49.129	**1.762**	12.588	49.129	2.774	19.816	43.027
3	**1.409**	10.062	59.192	**1.409**	10.062	59.192	1.716	12.257	55.284
4	**1.066**	7.614	66.805	**1.066**	7.614	**66.805**	**1.613**	11.522	**66.805**
5	.685	4.890	71.695						
6	.655	4.676	76.371						
7	.603	4.306	80.677						
8	.555	3.962	84.639						
9	.498	3.558	88.197						
10	.445	3.176	91.373						
11	.435	3.109	94.483						
12	.303	2.162	96.644						
13	.247	1.766	98.411						
14	.223	1.589	100.000						

Extraction Method: Principal Component Analysis.

Table 4.13 Communalities

	Initial	Extraction
Varriation/changes in scope	1.000	.588
Client'ss cash flow problems	1.000	.796
Lack of proper feasibility studiesinto the availability of finance to complete a project	1.000	.796
The number of signatories that must append to the certificate	1.000	.823
Sheer disregard for the conditions of contract regarding payment	1.000	.660
Late preparation of interim valuation	1.000	.623
Late valuation of variation	1.000	.720
Innacurate bills of quantities	1.000	.550
Slow cordination and seeking of approval from concerened authorities	1.000	.621
Delay in work approval	1.000	.608
Lack of communication	1.000	.638
Poor contract management	1.000	.660
Liaison problems among the contracting parties	1.000	.730
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	1.000	.540

Extraction Method: Principal Component Analysis.

4.6.3 Labelling of Extracted Factors

The result of the EFA was interpreted by assigning labels to the extracted factors. (Cheng and Choy, 2007). The following are the factors and their corresponding labels:

Factor One: Project Management

	FACTOR LOADINGS
Variation/changes in scope	**.733**
Late preparation of interim valuation	**.774**
Late valuation of variation	**.830**
Inaccurate bills of quantities	**.652**
Slow coordination and seeking of approval from concerned authorities	**.531**
Delay in work approval	**.612**

Factor Two: Coordination among Contracting Parties

	FACTOR LOADINGS
Lack of communication	**.651**
Poor contract management	**.698**
Liaison problems among the contracting parties	**.825**
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	**.674**

Factor Three: Client's Financial Management

	FACTOR LOADINGS
Client's cash flow problems	**.872**
Lack of proper feasibility studies into the availability of finance to complete a project	**.831**

Factor Four: Client's Administration

	FACTOR LOADINGS
The number of signatories that must append to the certificate	**.902**
Sheer disregard for the conditions of contract regarding payment	**.632**

4.7 AGREEMENT AMONG THE FOUR GROUPS FOR ALL THE FOUR FACTORS

Oduro, Asamoah R. (2008), in his paper "Allocation and Management of Project Contingency Sum for Building Developments in Ashanti Region, Ghana,'' used statistical formulae such as Important Index, Kendall's Concordance Analysis and Chi-Square to determine the ranking of the factors determining contingency sum, and established the high degree of agreement among Quantity Surveyors, Architects and Civil Engineers on the factors influencing the determination of contingency sum.

Chi-Square (χ^2) is "a statistic used to compare frequencies of two or more groups". (Ohio Department of Mental Health, Research Glossary, July 2010). Kendall's Concordance Coefficient on the other hand "is used traditionally in statistics for measuring agreement between k ordering (k>2)" (Grzegorzewski P. 2006). Since this study deals with four groups of respondents (Public/ Civil Servants, Donor Agencies, Consultants and Contractors) it was deemed appropriate to use these statistical tools.

The Kendall's Concordance Coefficient and Chi-Square (χ^2) were employed to determine the agreement among all the four groups of respondents on all the 21 significant factors.

4.7.1 Ranking of Dependent Variables for Each Group of Respondents Using the Relative Important Index

Enshassi Adnan, et al (June 2007), work on "Factors Affecting Labour Productivity in Building Projects in the Gaza Strip" used The Relative Important Index(RII) to rank all the factors. This method was used to rank Dependent Variables for each group of respondents.

$$\mathbf{RII} = \left\{ \frac{\mathbf{5n5 + 4n4 + 3n3 + 2n2 + 1n1}}{\mathbf{5(n1 + n2 + n3 + n4 + n5)}} \right\} \mathbf{x\ 100}$$

Where RII = Relative Important Index

n1= Number of respondent who answered " Very Low"

n2= Number of respondent who answered " Low"

n3= Number of respondent who answered " Medium"

n4= Number of respondent who answered " High"

n5= Number of respondent who answered " Very High"

Tables 4.14 - 4.17 below shows the ranking of the Dependent Variables for each group:

Tables 4.14- Relative Importance Indices (RII) and Ranking for Donor Agencies.

FACTORS	SCALE AND No. OF RESPONSES					RII	RANKING
	1	2	3	4	5		
Variation / changes in scope	0.0	33.3	33.3	33.3	0.0	60.00	**10th**
Client's cash flow problems (The counterpart Funds)	41.7	16.7	0.0	41.7	0.0	48.33	**12th**
Lack of proper feasibility studies into the availability of finance to complete a project	50.0	16.7	16.7	8.3	8.3	41.64	**14th**
The number of signatories that must append to the certificate	0.0	0.0	41.7	16.7	41.7	80.00	**1st**
Sheer disregard for the conditions of contract regarding payment	0.0	50.0	0.0	41.7	8.3	61.66	**7th**
Late preparation of interim valuation	8.3	33.3	25.0	16.7	16.7	60.04	**9th**
Late valuation of variation	0.0	25.0	33.3	41.7	0.0	63.34	**6th**
Inaccurate bills of quantities	0.0	33.3	33.3	16.7	16.7	63.36	**5th**
Slow coordination and seeking of approval from concerned authorities	0.0	8.3	41.7	25.0	25.0	73.34	**3rd**
Delay in work approval	0.0	0.0	41.7	33.3	25.0	76.66	**2nd**
Lack of communication	16.7	58.3	16.7	0.0	8.3	44.98	**13th**
Poor contract management	8.3	8.3	33.3	50.0	0.0	65.03	**4th**
Liaison problems among the contracting parties	0.0	58.3	33.3	0.0	8.3	51.65	**11th**
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	0.0	41.7	8.3	50.0	0.0	61.66	**8th**

Tables 4.15- Relative Importance Indices (RII) and Ranking for Consultants.

FACTORS	SCALE AND No. OF RESPONSES					RII	RANKING
	1	2	3	4	5		
Variation / changes in scope	6.9	10.3	34.5	20.7	27.6	70.36	**3rd**
Client's cash flow problems (The counterpart Funds)	3.4	10.3	13.8	24.1	48.3	80.74	**1st**
Lack of proper feasibility studies into the availability of finance to complete a project	3.4	24.1	20.7	48.3	3.4	64.84	**6th**
The number of signatories that must append to the certificate	.0	10.3	27.6	41.4	20.7	74.50	**2nd**
Sheer disregard for the conditions of contract regarding payment	10.3	27.6	34.5	20.7	6.9	57.26	**12th**
Late preparation of interim valuation	6.9	17.2	37.9	31.0	6.9	62.76	**8th**
Late valuation of variation	10.3	24.1	34.5	31.0	0.0	57.26	**13th**
Inaccurate bills of quantities	3.4	24.1	37.9	27.6	6.9	62.10	**9th**
Slow coordination and seeking of approval from concerned authorities	6.9	6.9	20.7	58.6	6.9	70.34	**4th**
Delay in work approval	3.4	27.6	37.9	31.0	0.0	59.32	**10th**
Lack of communication	3.4	37.9	27.6	24.1	6.9	58.64	**11th**
Poor contract management	3.4	24.1	24.1	37.9	10.3	65.53	**5th**
Liaison problems among the contracting parties	6.9	27.6	44.8	17.2	3.4	56.52	**14th**
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	10.3	17.2	20.7	41.4	10.3	64.84	**7th**

Tables 4.16- Relative Importance Indices (RII) and Ranking for Contractors.

FACTORS	SCALE AND No. OF RESPONSES					RII	RANKING
	1	2	3	4	5		
Variation / changes in scope	3.8	25.0	26.9	34.6	9.6	64.24	**10th**
Client's cash flow problems (The counterpart Funds)	0.0	13.5	17.3	32.7	36.5	78.44	**2nd**
Lack of proper feasibility studies into the availability of finance to complete a project	1.9	21.2	32.7	28.8	15.4	66.92	**5th**
The number of signatories that must append to the certificate	3.8	9.6	11.5	36.5	38.5	79.28	**1st**
Sheer disregard for the conditions of contract regarding payment	15.4	7.7	25.0	30.8	21.2	66.93	**4th**
Late preparation of interim valuation	9.6	21.2	32.7	36.5	0.0	59.22	**11th**
Late valuation of variation	7.7	17.3	26.9	32.7	15.4	66.16	**6th**
Inaccurate bills of quantities	13.5	28.8	48.1	9.6	0.0	50.76	**14th**
Slow coordination and seeking of approval from concerned authorities	3.8	15.4	23.1	40.4	17.3	70.40	**3rd**
Delay in work approval	9.6	9.6	36.5	32.7	11.5	65.39	**8th**
Lack of communication	9.6	25.0	28.8	36.5	0.0	58.46	**12th**
Poor contract management	7.7	25.0	21.2	28.8	17.3	64.60	**9th**
Liaison problems among the contracting parties	11.5	25.0	34.6	26.9	1.9	56.54	**13th**
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	7.7	19.2	21.2	40.4	11.5	65.76	**7th**

Tables 4.17- Relative Importance Indices (RII) And Ranking For Public/ Civil Servants.

FACTORS	SCALE AND No. OF RESPONSES					RII	RANKING
	1	2	3	4	5		
Variation / changes in scope	13.5	13.5	43.2	27.0	2.7	58.38	**6th**
Client's cash flow problems (The counterpart Funds)	5.4	18.9	8.1	35.1	32.4	74.05	**1st**
Lack of proper feasibility studies into the availability of finance to complete a project	10.8	27.0	21.6	21.6	18.9	62.16	**3rd**
The number of signatories that must append to the certificate	10.8	21.6	27.0	18.9	21.6	63.78	**2nd**
Sheer disregard for the conditions of contract regarding payment	21.6	37.8	13.5	21.6	5.4	50.27	**12th**
Late preparation of interim valuation	8.1	21.6	48.6	18.9	2.7	57.30	**7th**
Late valuation of variation	8.1	21.6	48.6	18.9	2.7	57.30	**8th**
Inaccurate bills of quantities	16.2	32.4	40.5	8.1	2.7	49.73	**13th**
Slow coordination and seeking of approval from concerned authorities	2.7	27.0	32.4	32.4	5.4	62.16	**4th**
Delay in work approval	8.1	13.5	43.2	32.4	2.7	61.62	**5th**
Lack of communication	8.1	37.8	37.8	16.2	0.0	52.43	**11th**
Poor contract management	8.1	24.3	40.5	27.0	0.0	57.30	**9th**
Liaison problems among the contracting parties	16.2	45.9	35.1	2.7	0.0	44.86	**14th**
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	13.5	13.5	48.6	21.6	2.7	57.30	**10th**

The following Table 4.18 shows the calculation for the determination of the agreement:

Table 4.18: Kendall's Coefficient of Concordance Determination for all the Fourteen (14) Retained Variables

FACTORS	RANK				Sum of Ranking (SR_i)	Square of Ranking $(SR_i)^2$
	Donor Agencies	Consul-tants	Contrac-tors	Public/Civil Servants		
Variation / changes in scope	10	3	10	6	29	841
Client's cash flow problems (The counterpart Funds)	12	1	2	1	16	256
Lack of proper feasibility studies into the availability of finance to complete a project	14	6	5	3	28	784
The number of signatories that must append to the certificate	1	2	1	2	6	36
Sheer disregard for the conditions of contract regarding payment	7	12	4	12	35	1,225
Late preparation of interim valuation	9	8	11	7	35	1,225
Late valuation of variation	6	13	6	8	33	1,089
Inaccurate bills of quantities	5	9	14	13	41	1,681
Slow coordination and seeking of approval from concerned authorities	3	4	3	4	14	196
Delay in work approval	2	10	8	5	25	625
Lack of communication	13	11	12	11	47	2,209
Poor contract management	4	5	9	9	27	729
Liaison problems among the contracting parties	11	14	13	14	52	2,704
Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	8	7	7	10	32	1,024
						$\sum(SR_i)^2$ = **14,624.00**

Kendall's Coefficient of Concordance $W = \frac{S}{\frac{1}{12}k^2\left(n^3 - n\right)}$, and must be between 0 and 1.

Where:

$S = \sum (SR)^2 - n\left(\overline{SR}\right)^2$

k = Groups (columns) with n items in each

SR_i = Sum of Ranks for each Row

Mean of the SR_i s = $\overline{SR} = \frac{(n+1)k}{2}$

Chi-Square Calculation formula = $\chi^{2(n-1)} = k(n-1)W$

n=14, k=4

$$\overline{SR} = \frac{(14+1)4}{2} = \frac{60}{2} = 30.00$$

$$S = \sum (SR)^2 - n\left(\overline{SR}\right)^2 = 14{,}624 - 14(30)^2 = 2{,}024.0$$

$$W = \frac{S}{\frac{1}{12}k^2\left(n^3 - n\right)} = \frac{2{,}024}{\frac{1}{12}(4)^2\left(14^3 - 14\right)} = 0.56$$

Hypothesis testing [Chi-Squared Test (χ^2)]

Testing the significance of W at the α = 0.05 (5%) level of significance.

H_0: the set of rankings by Public/ Civil Servants, Donor Agencies, Consultants and Contractors are independent/ unrelated (Do not Agree).

H_1: the set of rankings by Public/ Civil Servants, Donor Agencies, Consultants and Contractors are related (Do Agree).

A significant level of α = 0.05 was used.

We reject H_0 if $X^2_{cal} > X^2_{table}$ where X^2_{cal} is the calculated Chi-Squared value and X^2_{table} is the Chi-Squared value read from the Chi-Squared distribution table.

X^2_{cal} = k (n-1) W where k is the number of groups being compared (Public/ Civil Servants, Donor Agencies, Consultants and Contractors)

$$\chi^2 = k(n-1)W = 4(13)(0.56) = 29.12$$

From the X^2 distribution table, $\chi^{2(n-1)}_{\alpha} = \chi^{2(13)}_{.05} = 22.362$

Since $X^2_{cal} > X^2_{table}$ we Reject null hypothesis and Accept the alternative hypothesis concluding that the four(4) group (Public/ Civil Servants, Donor Agencies, Consultants and Contractors) agree on the above fourteen(14) retained dependent variables forming the four factors affecting delayed payments on donor funded road projects in Ghana. This shows that the respondents (Public/ Civil Servants, Donor Agencies, Consultants and Contractors) agreed in opinion on the fourteen(14) retained dependent variables forming the four factors affecting delayed payments on donor funded road projects in Ghana.

4.8 PROVE OF HYPOTHESIS

The agreement among the four groups on the above fourteen (14) retained dependent variables forming the four factors, which include "The number of signatories that must append to the certificate", prove the hypothesis of this study.

4.9 SUMMARY OF RETAINED DEPENDENT VARIABLES FORMING THE FOUR FACTORS AS AGREED BY THE FOUR GROUPS OF RESPONDENTS

The above analysis indicates that, the factors that affect delayed payments on donor funded road projects in Ghana are as follows:

A. PROJECT MANAGEMENT

A.1 Variation/changes in scope

A.2 Late preparation of interim valuation

A.3 Late valuation of variation

A.4 Inaccurate bills of quantities

A.5 Slow coordination and seeking of approval from concerned authorities

A.6 Delay in work approval

B. COORDINATION AMONG CONTRACTING PARTIES

B.1 Lack of communication

B.2 Poor contract management

B.3 Liaison problems among the contracting parties

B.4 Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment

C. CLIENT'S FINANCIAL MANAGEMENT

C.1 Client's cash flow problems

C.2 Lack of proper feasibility studies into the availability of finance to complete a project

D. CLIENT'S ADMINISTRATION

D.1 The number of signatories that must append to the certificate

D.2 Sheer disregard for the conditions of contract regarding payment

4.10 OTHER VARIABLES FROM RESPONDENTS

The respondents were asked to indicate other variables not indicated on the questionnaire and rate them. The following are variables listed by some of the respondents:

1 Change in Political leadership

2 Disputes

3 Delay in release of funds from the donor agencies

4 Bribe paid before certificate is signed

5 Consultants poor performance

6 Unavailability of authorized signatories to endorse certificate

7 Inadequate supporting document

8 Inadequate processing time

9 Effective time of payment due date

10 Lack of standard implementation procedure.

REFERENCES

1 Aibinu, A.A and Odeyinka, H. A. (2006), Construction Delays and Their Causative Factors in Nigeria, Journal of Construction Engineering and Management © ASCE/July 2006

2 Bagozzi, R.P. (1981). An examination of the validity of two measures of attitude. *Multivariate Behavioral Research*, 16, 323-359.

3 Cheng T. C. E. and. Choy Petrus W.C (2007), Measuring Success Factors of Quality Management in the Shipping Industry https://secure.palgrave-journals.com/mel/journal/v9/n3/abs/9100179a.html Accessed 23rd April, 2011

4 Enshassi Adnan, etal (June 2007), Factors Affecting Labour Productivity in Building Projects in the Gaza Strip, Journal of Civil Engineering and Management June 2007, Vol XIII, No. 4, 245-254, www.jcem.vgtu.lt/upload/civil_zum/enshassi%20et%20al.pdr. Accessed 20th May, 2010

5 Field A.(2005), Discovering Statistics Using SPSS, SAGE Publications, London. Thousand Oaks. New Delhi

6 Grzegorzewski P. (2006), The Coefficient Of Concordance For Vague Data, http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V8V-4JXY1R3-5& Accessed 22nd July, 2010

7 Hair, Jr., J.F., Anderson, R.E., Tatham, R.L., and Black, W.C. (1998). *Multivariate Data Analysis. 5th Edition*. Prentice-Hall, Englewood Cliffs, NJ.

8 Hutcheson, G. & Sofroniou, N. (1999), The Multivariate Social Scientist. London: Sage.

9 Kaiser, H.F. (1974). An Index of Factorial Simplicity. Psychometrika, 39, 31-36

10 MacCallum, R.C., Widaman, K.F, Zhang, S. & Hong, S. (1999), Sample Size in Factor Analysis. Psychological Methods, 4(1), 84-99

11 Ngai, E.W.T., Cheng, T.C.E. and Ho, S.S.M. (2004). Critical success factors of web-based supply-chain management systems: an exploratory study. *Production Planning & Control*, 15(6), 622-630.

12 Nunnally, J.C. (1978). *Psychometric Theory*. McGraw-Hill, New York, NY.

13 Oduro, Asamoah R. (2008), "Allocation and Management of Project Contingency Sum for Building Developements in Ashanti Region, Ghana,'' Department of Building Technology, Kwame Nkrumah University of Science and Technology. (Unpublished Thesis)

14 Ohio Department of Mental Health, Research Glossary (July 2010), Chi-Square. http://www.mh.state.oh.us/what-we-do/promote/research-and-evaluation/learning-lab/r

Accessed 22nd July, 2010

15 Oppong Ben (2003), Causes of Construction Delays in Ghana, Department of Building Technology, Kwame Nkrumah University of Science and Technology (Unpublished Thesis)

16 The Kendall Coefficient of Concordance, courses.wcupa.edu/rbove/eco252/252corr.doc. Accessed 29th June, 2010

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Payment to contractors on time must be a main priority the government must set, since delay to payment leads to additional cost to the project in terms of interest and delays the entire project completion.

The main aim of this study, as shown in chapter one, is to identify the significant factors that affect delayed payment which will greatly provide a basis for policies to be implemented to prevent or curtail the delay in honouring payment certificates on donor funded road projects in Ghana.

5.2 CONCLUSIONS

The main conclusions of the study are as follows:

1 The twenty (20) dependent variables ranked by the respondents were all found to be significant based on SPSS's Chi-Square Test tool, which was used to determine the Asymptomatic Significant (Asymp. Sig.). Exploratory Factor Analysis was further used to establish the Principal Components (factors) of the established significant variables. The following are the factors affecting delayed payment on donor funded road projects in Ghana, with their corresponding dependent variables:

A. PROJECT MANAGEMENT

A.1 Variation/changes in scope

A.2 Late preparation of interim valuation

A.3 Late valuation of variation

A.4 Inaccurate bills of quantities

A.5 Slow coordination and seeking of approval from concerned authorities

A.6 Delay in work approval

B. COORDINATION AMONG CONTRACTING PARTIES

B.1 Lack of communication

B.2 Poor contract management

B.3 Liaison problems among the contracting parties

B.4 Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment

C. CLIENT'S FINANCIAL MANAGEMENT

C.1 Client's cash flow problems

C.2 Lack of proper feasibility studies into the availability of finance to complete a project

D. CLIENT'S ADMINISTRATION

D.1 The number of signatories that must append to the certificate

D.2 Sheer disregard for the conditions of contract regarding payment

2 The above fourteen (14) retained variables were subjected to Kendall's Concordance Coefficient and Chi-Squared Tests to ascertain the agreement among the four respondent groups. It was found that the four groups of respondents were in agreement to all fourteen (14) retained variables forming the four factors affecting delayed payment on donor funded road projects in Ghana.

5.3 RECOMMENDATIONS

Based on the findings from the research the following recommendations are made:

5.3.1 PROJECT MANAGEMENT

Award of contract to competent Consultants and Contractors with qualified personnel will go a long way to ensure that the feasibility studies, designs and supervision of the projects are well done. This will minimise the negative effects of variables such as variation /changes in scope, late preparation of interim valuation, late valuation of variation, inaccurate bills of quantities, etc. If the effect of these variables is minimised, it will go a long way to help the client to efficiently manage its financial obligation. This is because the negative effects of variables such variation /changes in scope, late valuation of variation, and Inaccurate bills of quantities could raise project cost to a level that the client will find it difficult to finance and that will result in delay of payment of certificates. Consultants and Contractors should therefore update the expertise level of their personnel by encouraging them to attend seminars, short term courses and lectures organised by recognised bodies such as Ghana Institution of surveyors, Ghana Institution of Engineers and Department of Building Technology.

5.3.2 COORDINATION AMONG CONTRACTING PARTIES

Clients, Consultants and Contractors should all see the project as their own and coordinate effectively. This will ensure that communication flows freely among the contracting parties leading to good contract management and void of liaison problems. This coordination will enable the Consultant to update the client with Cash Flow forecasts to help the client to make provision for funds at programmed periods.

5.3.3 CLIENT'S FINANCIAL MANAGEMENT

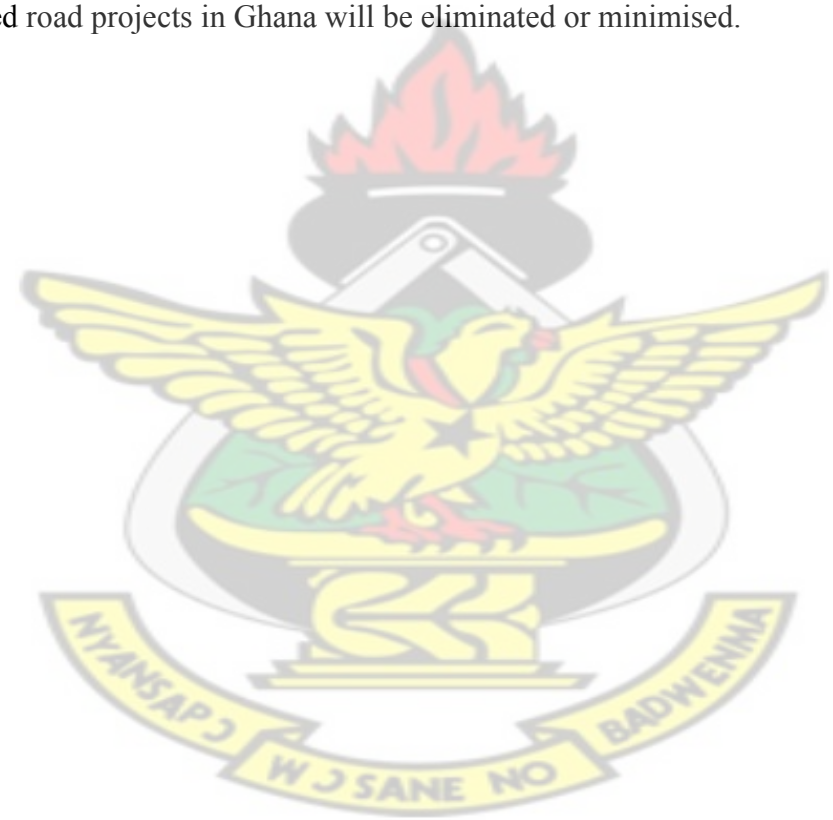
The Government knowing the huge amount of money spent in paying interest due to delay in payment must show serious financial commitment to every donor funded road project. It will be helpful to conduct proper feasibility studies to ascertain the availability or otherwise of the counter part funding. Once availability of the counter part funding has been established, Government should commit itself to it in order to avoid or reduce delay in payments. If the counter part funding is not available then there is no need to commence the project. The project commencement has to be delayed.

5.3.4 CLIENT'S ADMINISTRATION

Ugboro and Obeng (2000) (cited in Cheng and Choy, 2007) indicated that employee training and empowerment are crucial elements of a successful quality management programme. Based on this assertion, personnel involved with the processing of the certificate should be trained more especially in the conditions of contract regarding payment, either in house or through seminars. This will help them to understand the financial implication to both the Government of Ghana and the Contractor if they delay in

processing certificates. This will go a long way to help the personnel to attach a sense of exigency to their work. Government should take a second look at the number of signatories that must be appended to the certificate and try to reduce the number in order to minimise the delay caused by this number of signatories.

When the above recommendations are implemented, delay in payments to Contractors on donor funded road projects in Ghana will be eliminated or minimised.



5.4 FUTURE RESEACH

A research should to be conducted to determine the number of signatories that must be appended to the certificate on donor funded road projects in Ghana and offer recommendation for some signatories to be eliminated.

REFERENCE

1 Ugboro, I.S. and Obeng, K. (2000). Top management leadership, employee empowerment, job satisfaction, and customer satisfaction in TQM organizations: an empirical study. *Journal of Quality Management*, 5, 247-272.

BIBLIOGRAPHY

1 Anthony, N. Robert and Welsch, A. Glenn (1981), Fundamentals of Management Accounting 3rd Edition, (Richard D. Irwin, INC. 1981).

2 Box, E.P. George and Tiao, C. George (1992), Bayesian Inference in Statistical Analysis, (John Wiley and Sons, INC. 1992).

3 Burke, Rory (1993), Project Management Planning and Control 2nd Edition (John Wiley and Sons, INC. 1993).

4 Casella, George and Berger, L. Roger (1990), Statistical Inference, (Duxbury Press, a division of Wadsworth, INC. 1990).

5 Christenson, Ronald. (1996), Analysis of Variance, Design and Regression: Applied Statistical Methods,(Chapman & Hall/CRC, 1996).

6 Eskew, K. Robert and Jensen, L. Daniel (1996), Financial Accounting, 5th Edition, (The McGraw-Hill Companies, INC. 1996).

7 Journal of Construction Engineering and Management © ASCE, Construction Division/March 1997, Vol. 123, No.1

8 Kerlinger, N. Fred and Pedhazur, J. Elazer (1973), Multiple Regression in Behavioral Research, (Holt, Rinehart and Winston, INC, 1973).

APPENDIX 1

QUESTIONAIRE TO PUBLIC/CIVIL SERVANTS, DONOR AGENCES, CIVIL WORKS CONSULTANTS, AND CONTRACTORS

DATE: APRIL 2010

PROJECT TOPIC: FACTORS AFFECTING DELAYED PAYMENT ON DONOR FUNDED ROAD PROJECTS IN GHANA

INTRODUCTION

I am a student of Kwame Nkrumah University of Science and Technology currently studying for MSc degree in Construction Management in the Department of Building Technology. In partial fulfillment of my degree requirements I am currently undertaking a research into factors affecting delayed payment on donor funded road projects in Ghana.

The purpose of this questionnaire is to solicit the opinion of officials involved in the process of payment certificates.

For your information the questionnaire is designed with immense flexibility and simplicity and can be completed either manually or electronically.
Your contribution towards this survey is highly valued. Please be assured that any information you provide will be treated with strict confidence and do not leave any identification marks on the form in order for you to remain anonymous.

Please you could send your query for clarification or response to the addresses below.

Thank you.

To complete this questionnaire electronically, first double left click on the appropriate box(s), then at the *Default value* click on *"Checked"* where applicable, *"Not checked"* if you want to reverse your decision and finally click on *"OK "* in both cases to register your response.

0277-762462
ezedo@hotmail.com
ezedojunior@yahoo.com
P.O. BOX CT 1067 CANTONMENTS-ACCRA, GHANA.

1 Which area of construction are you involved in?

☐ Public Servants/Civil Servants ☐ Donor Agency ☐ Consultant ☐ Contractor

2 How long have you been in the construction industry?

☐ 0-5years ☐ 6- 10years ☐ 11-20years ☐ 21 years and above

3 Please indicate your training/educational level

i. City and Guilds ☐
ii. Higher National Diploma/Diploma ☐
Iii Bachelor of Science/Bachelor of Arts ☐
iii. Master of Science/Master of Arts ☐
iv. PhD or higher ☐
v. Professional Qualifications and type of institution…….

4. Are you familiar with payment certificates for road projects?

☐ Yes ☐ No

5 If yes to question 4, have you had any role in processing/preparation/issue of payment certificates for road projects?

☐ Yes ☐ No

6 Are you aware that the Government of Ghana pays Interest to contractors as a result of delay in honouring payment certificates?

☐ Yes ☐ No

7 The table below is a list of variables affecting delayed payment on Donor Funded Road Projects in Ghana. Please rank these variables in order of significance by ticking the appropriate boxes.

FACTORS AFFECTING DELAYED PAYMENT ON DONOR FUNDED ROAD PROJECTS IN GHANA						
Item	**Variables**	***(1)Very Low***	***(2) Low***	***(3) Medium***	***(4) High***	***(5)Very High***
1	Variations/Changes in scope	☐	☐	☐	☐	☐
2	Client's slow decision making	☐	☐	☐	☐	☐
3	Client's cash flow problems(Counterpart Funds	☐	☐	☐	☐	☐
4	Lack of proper feasibility studies into the availability of finance to complete a Project	☐	☐	☐	☐	☐
5	The number of signatories that must append to the certificate	☐	☐	☐	☐	☐
6	Sheer disregard for the conditions of contract regarding payment	☐	☐	☐	☐	☐
7	Late preparation of interim valuation	☐	☐	☐	☐	☐
8	Late valuation of variation	☐	☐	☐	☐	☐
9	Inaccurate bills of quantities	☐	☐	☐	☐	☐
10	Slow coordination and seeking of approval from concerned authorities	☐	☐	☐	☐	☐
11	Delay in work approval	☐	☐	☐	☐	☐

FACTORS AFFECTING DELAYED PAYMENT ON DONOR FUNDED ROAD PROJECTS IN GHANA						
Item	**Variables**	***(1)Very Low***	***(2) Low***	***(3) Medium***	***(4) High***	***(5)Very High***
12	Poor information dissemination	☐	☐	☐	☐	☐
13	Lack of communication	☐	☐	☐	☐	☐
14	Personality clash between contractor Agent and Resident Engineer	☐	☐	☐	☐	☐
15	Test and inspection of works	☐	☐	☐	☐	☐
16	Poor contract management	☐	☐	☐	☐	☐
17	Lack of skilled technical personnel	☐	☐	☐	☐	☐
18	Liaison problems among the contracting parties	☐	☐	☐	☐	☐
19	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment.	☐	☐	☐	☐	☐
20	Political leanings of the directors of the company	☐	☐	☐	☐	☐

Please you may indicate other factors not indicated on this list (if applicable) and rate them as 6 above.

FACTORS AFFECTING DELAYED PAYMENT ON DONOR FUNDED ROAD PROJECTS IN GHANA						
Item	**Variables**	***(1)Very Low***	***(2) Low***	***(3) Medium***	***(4) High***	***(5)Very High***
23		☐	☐	☐	☐	☐
24		☐	☐	☐	☐	☐
25		☐	☐	☐	☐	☐
26		☐	☐	☐	☐	☐
27		☐	☐	☐	☐	☐
28		☐	☐	☐	☐	☐
29		☐	☐	☐	☐	☐

APPENDIX 2

RESULTS OF SPSS - SIGNIFICANT VARIABLES

			Variation/changes in scope	Client's slow decision making	Client's cash flow problems
Chi-Square			34.692[a]	27.923[a]	41.923[a]
df			4	4	4
Asymp. Sig.			.000	.000	.000
Monte Carlo Sig.	Sig.		.000[d]	.000[d]	.000[d]
	95% Confidence Interval	Lower Bound	.000	.000	.000
		Upper Bound	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0. b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8. c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5.

d. Based on 10000 sampled tables with starting seed 79654295.

			Lack of proper feasibility studies into the availability of finance to complete a project	The number of signatories that must append to the certificate	Late preparation of interim valuation
Chi-Square			18.692[a]	33.615[a]	50.769[a]
df			4	4	4
Asymp. Sig.			.001	.000	.000
Monte Carlo Sig.	Sig.		.001[d]	.000[d]	.000[d]
	95% Confidence Interval	Lower Bound	.000	.000	.000
		Upper Bound	.002	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0. b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8. c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5. d. Based on 10000 sampled tables with starting seed 79654295.

			Late valuation of variation	Inaccurate bills of quantities	Slow coordination and seeking of approval from concerned authorities
Chi-Square			41.923[a]	62.846[a]	52.923[a]
df			4	4	4
Asymp. Sig.			.000	.000	.000
Monte Carlo Sig.	Sig.		.000[d]	.000[d]	.000[d]
	95% Confidence Interval	Lower Bound	.000	.000	.000
		Upper Bound	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5.

d. Based on 10000 sampled tables with starting seed 79654295.

Test Statistics

			Delay in work approval	Poor information dissemination	Lack of communication
Chi-Square			57.308[a]	50.031[b]	50.769[a]
df			4	4	4
Asymp. Sig.			.000	.000	.000
Monte Carlo Sig.	Sig.		.000[d]	.000[d]	.000[d]
	95% Confidence Interval	Lower Bound	.000	.000	.000
		Upper Bound	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5.

d. Based on 10000 sampled tables with starting seed 79654295.

			Personality clash between contractor Agent and Resident Engineer	Test and inspection of works	Poor contract management
Chi-Square			57.385[a]	24.154[c]	33.769[a]
df			4	3	4
Asymp. Sig.			.000	.000	.000
Monte Carlo Sig.	Sig.		.000[d]	.000[d]	.000[d]
	95% Confidence Interval	Lower Bound	.000	.000	.000
		Upper Bound	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5.

d. Based on 10000 sampled tables with starting seed 79654295.

Test Statistics

			Lack of skilled technical personnel	Liaison problems among the contracting parties	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment
Chi-Square			60.692[a]	59.769[a]	38.231[a]
df			4	4	4
Asymp. Sig.			.000	.000	.000
Monte Carlo Sig.	Sig.		.000[d]	.000[d]	.000[d]
	95% Confidence Interval	Lower Bound	.000	.000	.000
		Upper Bound	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5.

d. Based on 10000 sampled tables with starting seed 79654295.

Test Statistics

			Political leanings of the directors of the company	Sheer disregard for the conditions of contract regarding payment
Chi-Square			16.538[a]	10.385[a]
df			4	4
Asymp. Sig.			.002	.034
Monte Carlo Sig.	Sig.		.003[d]	.038[d]
	95% Confidence Interval	Lower Bound	.002	.034
		Upper Bound	.004	.042

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.8.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.5.

d. Based on 10000 sampled tables with starting seed 79654295.

APPENDIX 3

RESULTS OF THE SPSS –DETERMINANT

Correlation Matrix[a]

		Variation/changes in scope	Client's cash flow problems	Lack of proper feasibility studies into the availability of finance to complete a project	The number of signatories that must append to the certificate
Correlation	Variation/changes in scope	1.000	.137	.241	.143
	Client's cash flow problems	.137	1.000	.600	.031
	Lack of proper feasibility studies into the availability of finance to complete a project	.241	.600	1.000	.014
	The number of signatories that must append to the certificate	.143	.031	.014	1.000
	Sheer disregard for the conditions of contract regarding payment	.207	.163	.126	.459

a. Determinant = .003

Correlation Matrix[a]

		Sheer disregard for the conditions of contract regarding payment	Late preparation of interim valuation	Late valuation of variation	Inaccurate bills of quantities
Correlation	Variation/changes in scope	.207	.420	.511	.435
	Client's cash flow problems	.163	.095	.085	.002
	Lack of proper feasibility studies into the availability of finance to complete a project	.126	.271	.274	.157
	The number of signatories that must append to the certificate	.459	.067	.178	.161
	Sheer disregard for the conditions of contract regarding payment	1.000	.251	.289	.311

a. Determinant = .003

Correlation Matrix[a]

		Slow coordination and seeking of approval from concerned authorities	Delay in work approval	Lack of communication	Poor contract management
Correlation	Variation/changes in scope	.346	.473	.312	.255
	Client's cash flow problems	.113	.028	.324	.134
	Lack of proper feasibility studies into the availability of finance to complete a project	.099	.230	.455	.291
	The number of signatories that must append to the certificate	.297	.245	.176	-.040
	Sheer disregard for the conditions of contract regarding payment	.479	.435	.416	.373

a. Determinant = .003

Correlation Matrix[a]

		Liaison problems among the contracting parties	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment
Correlation	Variation/changes in scope	.116	.174
	Client's cash flow problems	.295	.256
	Lack of proper feasibility studies into the availability of finance to complete a project	.286	.305
	The number of signatories that must append to the certificate	.131	.173
	Sheer disregard for the conditions of contract regarding payment	.380	.357

a. Determinant = .003

Correlation Matrix[a]

		Variation/changes in scope	Client's cash flow problems	Lack of proper feasibility studies into the availability of finance to complete a project	The number of signatories that must append to the certificate
Correlation	Late preparation of interim valuation	.420	.095	.271	.067
	Late valuation of variation	.511	.085	.274	.178
	Inaccurate bills of quantities	.435	.002	.157	.161
	Slow coordination and seeking of approval from concerned authorities	.346	.113	.099	.297
	Delay in work approval	.473	.028	.230	.245
	Lack of communication	.312	.324	.455	.176
	Poor contract management	.255	.134	.291	-.040
	Liaison problems among the contracting parties	.116	.295	.286	.131
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.174	.256	.305	.173
Sig. (1-tailed)	Variation/changes in scope		.060	.003	.053
	Client's cash flow problems	.060		.000	.362
	Lack of proper feasibility studies into the availability of finance to complete a project	.003	.000		.436
	The number of signatories that must append to the certificate	.053	.362	.436	
	Sheer disregard for the conditions of contract regarding payment	.009	.032	.077	.000
	Late preparation of interim valuation	.000	.142	.001	.223
	Late valuation of variation	.000	.168	.001	.021
	Inaccurate bills of quantities	.000	.490	.037	.034
	Slow coordination and seeking of approval from concerned authorities	.000	.099	.131	.000
	Delay in work approval	.000	.374	.004	.002
	Lack of communication	.000	.000	.000	.023
	Poor contract management	.002	.064	.000	.327

a. Determinant = .003

Correlation Matrix[a]

		Sheer disregard for the conditions of contract regarding payment	Late preparation of interim valuation	Late valuation of variation	Inaccurate bills of quantities
Correlation	Late preparation of interim valuation	.251	1.000	.618	.482
	Late valuation of variation	.289	.618	1.000	.435
	Inaccurate bills of quantities	.311	.482	.435	1.000
	Slow coordination and seeking of approval from concerned authorities	.479	.388	.531	.444
	Delay in work approval	.435	.405	.511	.450
	Lack of communication	.416	.292	.353	.392
	Poor contract management	.373	.294	.427	.384
	Liaison problems among the contracting parties	.380	.204	.174	.289
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.357	.171	.153	.241
Sig. (1-tailed)	Variation/changes in scope	.009	.000	.000	.000
	Client's cash flow problems	.032	.142	.168	.490
	Lack of proper feasibility studies into the availability of finance to complete a project	.077	.001	.001	.037
	The number of signatories that must append to the certificate	.000	.223	.021	.034
	Sheer disregard for the conditions of contract regarding payment		.002	.000	.000
	Late preparation of interim valuation	.002		.000	.000
	Late valuation of variation	.000	.000		.000
	Inaccurate bills of quantities	.000	.000	.000	
	Slow coordination and seeking of approval from concerned authorities	.000	.000	.000	.000
	Delay in work approval	.000	.000	.000	.000
	Lack of communication	.000	.000	.000	.000
	Poor contract management	.000	.000	.000	.000

a. Determinant = .003

Correlation Matrix[a]

		Slow coordination and seeking of approval from concerned authorities	Delay in work approval	Lack of communication	Poor contract management
Correlation	Late preparation of interim valuation	.388	.405	.292	.294
	Late valuation of variation	.531	.511	.353	.427
	Inaccurate bills of quantities	.444	.450	.392	.384
	Slow coordination and seeking of approval from concerned authorities	1.000	.587	.352	.371
	Delay in work approval	.587	1.000	.426	.363
	Lack of communication	.352	.426	1.000	.502
	Poor contract management	.371	.363	.502	1.000
	Liaison problems among the contracting parties	.363	.385	.623	.438
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.387	.316	.361	.370
Sig. (1-tailed)	Variation/changes in scope	.000	.000	.000	.002
	Client's cash flow problems	.099	.374	.000	.064
	Lack of proper feasibility studies into the availability of finance to complete a project	.131	.004	.000	.000
	The number of signatories that must append to the certificate	.000	.002	.023	.327
	Sheer disregard for the conditions of contract regarding payment	.000	.000	.000	.000
	Late preparation of interim valuation	.000	.000	.000	.000
	Late valuation of variation	.000	.000	.000	.000
	Inaccurate bills of quantities	.000	.000	.000	.000
	Slow coordination and seeking of approval from concerned authorities		.000	.000	.000
	Delay in work approval	.000		.000	.000
	Lack of communication	.000	.000		.000
	Poor contract management	.000	.000	.000	

a. Determinant = .003

Correlation Matrix[a]

		Liaison problems among the contracting parties	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment
Correlation	Late preparation of interim valuation	.204	.171
	Late valuation of variation	.174	.153
	Inaccurate bills of quantities	.289	.241
	Slow coordination and seeking of approval from concerned authorities	.363	.387
	Delay in work approval	.385	.316
	Lack of communication	.623	.361
	Poor contract management	.438	.370
	Liaison problems among the contracting parties	1.000	.522
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.522	1.000
Sig. (1-tailed)	Variation/changes in scope	.095	.024
	Client's cash flow problems	.000	.002
	Lack of proper feasibility studies into the availability of finance to complete a project	.000	.000
	The number of signatories that must append to the certificate	.069	.025
	Sheer disregard for the conditions of contract regarding payment	.000	.000
	Late preparation of interim valuation	.010	.026
	Late valuation of variation	.024	.041
	Inaccurate bills of quantities	.000	.003
	Slow coordination and seeking of approval from concerned authorities	.000	.000
	Delay in work approval	.000	.000
	Lack of communication	.000	.000
	Poor contract management	.000	.000

a. Determinant = .003

Correlation Matrix[a]

		Variation/changes in scope	Client's cash flow problems	Lack of proper feasibility studies into the availability of finance to complete a project	The number of signatories that must append to the certificate
Sig. (1-tailed)	Liaison problems among the contracting parties	.095	.000	.000	.069
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.024	.002	.000	.025

a. Determinant = .003

Correlation Matrix[a]

		Sheer disregard for the conditions of contract regarding payment	Late preparation of interim valuation	Late valuation of variation	Inaccurate bills of quantities
Sig. (1-tailed)	Liaison problems among the contracting parties	.000	.010	.024	.000
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.000	.026	.041	.003

a. Determinant = .003

Correlation Matrix[a]

		Slow coordination and seeking of approval from concerned authorities	Delay in work approval	Lack of communication	Poor contract management
Sig. (1-tailed)	Liaison problems among the contracting parties	.000	.000	.000	.000
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.000	.000	.000	.000

a. Determinant = .003

Correlation Matrix[a]

		Liaison problems among the contracting parties	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment
Sig. (1-tailed)	Liaison problems among the contracting parties		.000
	Lack of programming for the projects especially using cost-time graph for the client to know his financial commitment	.000	

a. Determinant = .003