

*Full Length Research Paper*

# **Project characteristics influence on risk associated with construction clients' cash flow prediction**

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## **Abstract**

**Project characteristics have been identified as major causes of inaccurate cash flow prediction which makes it exposed to more risk, the extent of its impact is a major concern to the construction cost professionals. The purpose of this paper is to investigate the relationship between project characteristics and risk associated with predicted clients' cash flow. One hundred and twenty four (124) construction clients' representatives in cash flow management (consultant quantity surveyors) in Nigeria were surveyed using systematic and purposive sampling techniques. 22 significant individual risk factors and 8 reduced risk factors were subjected to Analysis of Variance (ANOVA) using test of hypothesis to study the influence of the project characteristics on the risk associated with client's cash flow prediction. The result showed that there exist a significant relationship between project value and individual risk factors; and between project value and reduced risk factors (nature of the project, tendering procedure related factors). Also, project type and procurement method had significant influence on valuation assessment as a risk factor when forecasting cash flow by the clients. The construction professionals should take cognizance of project characteristics in managing risk at the early stage of the project so as to minimize the effect on project delivery variables at all other stages of construction.**

**Keywords:** Characteristics, construction clients' cash flow, prediction, project, risk.

## **INTRODUCTION**

Financial factors had greater influence on the success or failure of construction industry. Such factors include bad financial management (Halim et al., 2010) through poor monitoring system for cash flow. Cash flow management has become a matter of concern to both contractors and clients. The contractor requires the incidence of interim payment from the client to proper preparation of working capital requirement. The client from his own point of view, also will be concerned with the cost of proposed and source of fund to meet up with interim payment as at when due and how to carefully allocate available limited capital for several competing projects. This necessitates the need for development of accurate prediction of cash flow by the client.

### **Risk and Client cash flow prediction**

The expectation of construction participants especially clients has not been met due to non achievement of

project success as expected. Client has a role to arrange for finances for the project and make predictions of the total cost of the project and associated fees and charges. According to Sambasivan and Soon (2007), construction involves huge sum of money and most contractors find it very difficult to bear the heavy daily construction expenses when payments are delayed which will invariably affect the progress of work. Also, one of the main problems faced by contractors is delay in receiving payment from the client; to avert this, there is need for client to predict the cash flow so as to know how to source for the required amount at the right time to meet up with the contractors expectation (Ojo, 2010). However, Onukwube (2005) revealed that an accurate forecast of construction cash flow has been a difficult issue due to risks and uncertainties inherent in construction projects.

High uncertainty and risk among other factors have been identified as factor that makes construction industry to be vulnerable to bankruptcy (Wang and Hg, 2010).

Risk is an important issue to contractors as well as clients and consultants of the industry. However, the problems of risk assessment are complex and poorly understood in practice (Laryea, 2008). The determinants of success of any project are delivery within the appropriate cost limit, measurable time frame, acceptable quality standard and a high level of client satisfaction. However, this has not been achieved; research work of NIQS (2003) revealed that projects are not actualized as budgeted. Construction is often cited as a highly risk-prone business because of the unique nature of the industry and its projects (Laryea, 2008). Risk in relation to construction is a variable in the process of construction project whose variation results in uncertainty as to the final cost, duration and quality of the project (Bufaied, 1987; Akintoye and MacLeod, 1997). According to Raftery (1994), risks have an upside, where there is possibility of gain, and a downward, when a loss may be incurred. Therefore, risk management becomes important in reducing (or possibly eliminating) uncertainty via hedging to protect against unfavorable outcomes. Odeyinka (2003) and Ojo (2010) emphasized that effect of risk is assessed through the risk factors, there is usually insufficient objective data to adequately calculate the occurrence and impact of risk events because of the individual nature of construction projects; hence some degree of subjective judgment is usually required.

Researchers on cash flow prediction included Skitmore (1992), Odeyinka and Lowe (2000a and b, 2001, 2002), Kenley (2001), Hwee and Tiong, (2002), Odeyinka (2003), Honoabu (2005), Odeyinka and Ojo, 2007, Odeyinka et al. (2008), Babalola and Ojo (2010), Ojo (2010). Sidwell and Rumball (1982) identified building type, height, shape and design characteristics, external environmental influences, individual contractors pricing characteristics and weather as causes of low accuracy of predicted cash flow. Peters (1984) also agreed that the overall success of cash flow forecast depends essentially on mode of payment, quality and reality of project programme, method of assessing interim payment, risk, level of required information, retention, currency of data, delay in honouring architect instruction and overestimating. Other factors identified were seasonal effects on construction works, variability in preliminary expenses, contract extensions of time for inclement weather and valuations (Calvert, 1986); estimating error, tendering strategies, cost variances and duration overrun (Kaka and Price, 1993 and Kaka, 1996); delay payment and difficulty in obtaining the right amount of funds at reasonable interest rates (Khosrowshahi, 2000); retention, claims, tender unbalancing and delay in receiving payments (Harris and McCaffer, 2001). Lowe (1987) and Laufer and Coheca (1990) grouped causes of inaccuracy of predicted cash flow into contractual, programming, pricing, valuation, economical and technological factors while Okema (1999) grouped them into exogenous and endogenous factors. All of them

discovered that accuracy of cash flow forecast was difficult to achieve due to certain requirements. These requirements were recognized by Odeyinka (2003), Odeyinka and Ojo (2007), Odeyinka et al. (2008), Babalola and Ojo (2010), Ojo (2010) as risk factors. While the listed authors assessed the risk factors as they affect cash flow prediction by either clients or contractors in general, this paper examined client's cash flow prediction risk with the aim of establishing a relationship with the project characteristics.

### **Project characteristics and risk in cash flow prediction**

Related researches on project characteristics included Georgy and Chang (2005), Ruben and Ger (2008) and Cho et al. (2009). Georgy and Chang (2005) investigated the impact of project characteristics on engineering performance using fuzzy neural network approach, Ruben and Ger (2008) examined and ranked project characteristics to be used in choosing procurement method type for future projects. He examined 42 characteristics identified by previous authors (Naoum, 1989; Bennett, 1991; Baccarini, 1996; Kuamaraswamy and Dissanayaka, 1998; Tukul and Rom, 1998; Chua et al., 1999; Dissanayaka and Kumarawamy, 1999 and Ling, 2004) and determined the most important ones. His finding showed that project complexity was the most important one which suggested that complexity of a project should be appropriately assessed in relation to the procurement method in use. Cho et al. (2009) studied 17 project characteristics and identified those that affected the level of project performance through structural equation model. Various project characteristics were investigated by these researchers; however, this paper focused on five major ones which have to do with the project itself and these were client type, project type, project duration, project value and procurement method.

Related studies on cash flow prediction revealed that the predictive ability of cash flow models had been hampered by host of factors which include project characteristics. Odeyinka and Lowe (2000, 2001) found that a more accurate modeling of cash flow forecast that takes risks and uncertainties into consideration would need to consider differing project groupings. Skitmore (1992) also found that segregating cash flow data into differing project groupings significantly improves the predictive power of developed models. These project characteristics included type of client, type of project, project size (Peters, 1984; Lowe, 1987; Lowe and Lowe, 1987 and Skitmore, 1992; Honoabu, 2005); project duration and procurement method (Sidwell and Rumball, 1982; Peter, 1984, Kaka and Dawood, 2000, Odeyinka, 2003; Odeyinka and Kaka, 2005 and Odeyinka et al., 2008). Most of these previous works focused on cash

**Table 1.** The distribution of respondents across diverse groupings

S/N	Respondent characteristics	Definition	Frequency	Percent
1.	Types of clients	Private	103	83.10
		Corporate	9	7.30
		Public	12	9.70
		Total	124	100.00
2.	Types of project executed	Public	53	42.70
		Private	71	57.30
		Total	124	100.00
3.	Procurement methods	Traditional	62	50.00
		Project Management	51	41.10
		Design and Build	11	8.90
		Total	124	100.00
4.	Project value in Naira	< 1 billion	80	64.50
		> 1 billion	44	35.50
		Total	124	100.00
5.	Project duration in months	1-12	49	39.50
		13-24	51	41.10
		25-36	24	19.40
		Total	124	100.00

flow generally, this paper assessed project characteristics in relation to clients' cash flow related risk.

## METHODOLOGY

Having established that project characteristics should be considered in predicting cash flow by the client (Honoabu, 2007; Odeyinka, 2003; Ojo, 2010), this paper focused on the Nigerian construction client through their cost representatives (quantity surveyors) with aim of establishing a relationship between project characteristics and risk associated with cash flow prediction. Questionnaire survey method was used in data collection. The focus of this study was on the construction clients in Nigeria; therefore, quantity surveyors who are the recognized client's representative in cost management were used as target respondents. One hundred and twenty four (124) registered and experienced quantity surveyors from public, private and corporate organizations were sampled using purposive and systematic sampling method. Their list was compiled through the directories of Nigeria Institute of Quantity Surveyors (NIQS) and Quantity Surveyors Registration Board of Nigeria (QSRBN). Data gathered were grouped based on the identified project characteristics of client types, project type, procurement method, project values and duration and were examined to determine their distribution across different dimensions. The result was as presented in Table 1. Twenty-two (22) significant individual factors and eight (8) reduced factors extracted from Ojo (2010) (Tables 2-5) were subjected to Analysis of Variance (ANOVA) using test of hypothesis. The hypotheses were as stated below:

### Hypothesis 1

$H_0$ : There is no statistically significant relationship between project characteristics and the occurrence of risk factors in clients' cash flow forecast.

$H_1$ : There is statistically significant relationship between project characteristics and the occurrence of risk factors in clients' cash flow forecast.

### Hypothesis 2

$H_0$ : There is no statistically significant relationship between project characteristics and the impact of risk factors on clients' cash flow forecast.

$H_1$ : There is statistically significant relationship between project characteristics and the impact of risk factors on clients' cash flow forecast.

## RESULT

Table 1 gave the summary of the data collected based on the identified project groupings which were used in establishing the relationship with the risk factors associated with clients' cash flow prediction. Most of the respondents (83.1%) surveyed were private clients while corporate clients were 7.3% and public clients were 9.7%. Fifty-seven percent (57%) of the clients indicated that they were involved in private projects and forty-three percent (43%) were involved in public projects. In terms of procurement method employed, fifty percent (50%) adopted traditional method, 41.1% employed project management approach while only 8.9% used design and build procedure. Considering the project value, sixty-five

**Table 2.** Significant individual Risk factors in client cash flow forecast

S/no	Individual Risk Factors
1	Inflation
2	Delay of critical activities
3	Provision for interim payment
4	Deviation from programme schedule
5	Duration overrun
6	Variation to work (architect instruction)
7	Change in client's brief
8	Adjustment of provisional sum
9	Provision for fluctuation payments
10	Complexity of work
11	Changes in interest rates
12	Payment for re-measured works
13	Changes in currency exchange rate
14	Delay in delivery of major materials and components to the site
15	Claims
16	Adjustment of prime cost sum
17	Obtaining the right amount of funds at reasonable interest rates
18	Government legislation
19	Overestimating
20	Project characteristics
21	Unfavourable contract condition
22	Tender unbalancing

Ojo (2010)

percent (64.5%) undertook projects within N1 billion while 35.5% undertook projects which cost more than N1 billion. Also, forty-one percent (41%) of the surveyed clients undertook projects between 13 and 24 months, 39.5% of them executed projects within 12 months while 19.4% of them had their projects executed between 25 and 36 months.

The result of ANOVA from Table 4 showed that  $f = 0.074, 0.729, 1.332$  and  $0.566$  for project types, procurement method, clients types and project duration respectively at  $p > 0.05$ . Therefore,  $H_0$  was accepted, that is, there is no statistically significant relationship between these project characteristics and the occurrence of risk factors in clients' cash flow forecast. This means that these characteristics (client type, project type, procurement method and project duration) had no influence on the occurrence of risk factors in clients' cash flow forecast. This is interpreted to mean that all the surveyed respondents experienced the occurrence of risk factors in the same way based on client type, project type, procurement method and project duration. However, result from Table 6 revealed that a statistically significant relationship existed between project value and the occurrence of risk factors in clients' cash flow forecast because  $F = 3.440$  at  $p < .05$  and  $H_0$  was rejected. It can, therefore, be said that the difference in the occurrence of

risk factors as experienced by client surveyed can be attributed to project value.

Moreover, observation from Table 6 showed the result of the relationship between the project characteristics and the occurrence of the reduced risk factors in clients' cash flow forecast. Considering the project type, procurement method, client type and project duration, one of the  $p$ -value (sig-value) was less than 0.05. Hence, the null hypothesis cannot be rejected which implied that the project type, procurement method, client type and project duration had no statistically significant relationship with the occurrence of risk factors in clients' cash flow forecast. It can then be concluded that these project characteristics did not influence the occurrence of these risk factors as experienced by construction clients when predicting cash flow. However, in the case of project value,  $p$ -values were less than 0.05 for risk due to nature of the project and tendering related factor. Hence the null hypotheses could not be accepted but rejected and it can then be concluded that there exists a statistically significant relationship between project value and occurrence of those two of these reduced factors (nature of the project and tendering related factor).

Table 5 gave the result of the relationship between project characteristics and risk impact. The value of  $F = 1.31, 0.01, 1.425, 0.21, 0.426$  for client type, project type,

**Table 3.** Extracted Factors with the Loaded Items and loading values

<b>Component Factors with the Loaded Items</b>	<b>Loading value</b>
<b>1. Client' brief consequence</b>	
▪ Delay of critical activities	0.472
▪ Deviation from programme schedule	0.476
▪ Duration overrun	0.623
▪ Variation to work	0.679
▪ Change in client's brief	0.437
▪ payment for re-measured works	0.654
<b>2. Nature of the Project</b>	
▪ Complexity of work	0.572
▪ Delay in delivery of major materials and components to the site	0.457
▪ Project characteristics	0.493
▪ Over valuation	0.760
▪ Force majeure	0.537
<b>3. Tendering related factor</b>	
▪ Provision for fluctuation payments	0.503
▪ Tender unbalancing	0.677
▪ Currency of cost data	0.475
<b>4. Sum adjustment</b>	
▪ Adjustment of prime cost sum	0.855
▪ Adjustment of provisional sum	0.840
<b>5. Clients' decision</b>	
▪ Change in client's brief	0.407
▪ Obtaining the right amount of funds at reasonable interest rates	0.470
▪ Unfavourable contract condition	0.690
▪ Inclement weather	0.479
<b>6. Economic related factors</b>	
▪ Change in client's brief	0.428
▪ Changes in currency exchange rate	0.666
▪ Changes in interest rates	0.752
<b>7. External influence</b>	
▪ Inflation	0.666
▪ Claims	0.666
▪ Government legislation	0.583
<b>8. Valuation assessment</b>	
▪ Provision for interim payment	0.809
▪ Currency of cost data	0.511

procurement method, project duration and project value respectively at  $p > 0.05$ . This implied that no statistically significant relationship was obtained between project characteristics and impact of risk factors on clients' cash flow forecast. This is interpreted to mean that all the clients experienced the effect of risk factors on clients' cash flow forecast in the same way, that is, none of the project characteristics significantly influenced the

respondents' experience of the effect of all the individual risk factors in Table 7. Considering the reduced risk factors, none of the p-value (sig-value) was less than 0.05 for client type, project value and project duration. Hence, the null hypothesis cannot be rejected; this implied that the client type, project value and project duration had no statistically significant relationship with the effect of reduced risk factors on clients' cash flow

**Table 4.** Relationship between project characteristics and the occurrence of risk factors

project characteristics	Project characteristics									
	Project Type		Procurement Method		Project value		Project duration		Client type	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Risk Factors										
All risk occurrence factors	.074	.786	.729	.485	<b>3.440</b>	<b>.035</b>	.566	.570	1.332	.268
Client's brief consequences	.200	.655	2.025	.137	1.683	.191	.492	.613	1.009	.368
Nature of the project	.002	.964	.184	.832	<b>3.458</b>	<b>.035*</b>	.607	.547	.728	.485
Tendering related and other extrogenous factors	.210	.648	.274	.761	<b>3.117</b>	<b>.048*</b>	.423	.656	1.898	.155
Sum adjustment	1.27	.262	1.762	.177	.060	.941	.162	.850	.520	.596
Client's decision	.185	.668	2.296	.105	2.143	.122	.315	.730	.171	.843
Economic related factors	.627	.430	.166	.847	3.041	.052	1.154	.319	1.105	.335
External influence	.253	.616	1.344	.265	.172	.842	.838	.435	1.170	.314
Valuation assessment	.952	.331	1.487	.231	.097	.907	.122	.885	.235	.791

**Table 5.** Relationship between project characteristics and the impact of risk factors

project characteristics	Project characteristics									
	Project Type		Procurement Method		Project value		Project duration		Client type	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Risk Factors										
All risk impact factors	.001	.970	1.425	.244	.426	.654	.021	.979	.131	.877
Client's brief consequences	.410	.523	1.797	.171	.554	.576	.450	.639	.738	.481
Nature of the project	.005	.942	.071	.931	1.593	.208	.388	.680	.034	.967
Tendering related and other extrogenous factors	.120	.730	.099	.906	1.093	.339	.442	.644	.499	.609
Sum adjustment	.136	.713	2.567	.081	.159	.853	.920	.402	.312	.733
Client's decision	.000	.998	.947	.391	.322	.725	.563	.571	.003	.997
Economic related factors	.857	.357	.197	.821	.791	.456	.694	.502	.130	.878
External influence	.448	.505	.424	.656	.027	.974	.555	.575	.467	.628
Valuation assessment	<b>4.535</b>	<b>.035*</b>	<b>3.632</b>	<b>.030*</b>	.001	.999	.910	.406	.532	.589

forecast. It can then be said that the impact of the reduced risk factors on clients' cash flow forecast was felt by the respondents in the same way despite the observed project characteristics. However, in the case of project type and procurement methods, p-values were generally greater than 0.05 particularly for all the individual risk factors but when the effect of the reduced risk factors were tested, the p-values were less than 0.05 for valuation assessment (F = 4.535 for project type and F = 3.632 for procurement method at  $p < 0.05$ ). Hence, the null hypotheses could not be accepted but rejected;

consequently it can be agreed that the impact of the valuation assessment as risk factor on clients' cash flow forecast varied for different project types and procurement methods.

## DISCUSSION OF FINDINGS

### Risk occurrence

The result of the ANOVA showed that client type, project

type, procurement method and project duration had no influence on the occurrence of all the individual risk and uncertainty factors. This implies that, occurrence of all the individual risk factors was observed to be the same regardless of the highlighted groupings. There was no significant difference obtained in the occurrence of all risk factors in clients' cash flow forecast based on the clients' type. This may be interpreted to mean that all the client types experienced the frequency of occurrence of risk factors in the same way. This may be expected because the private clients dominated the sampled respondents and a times public as well as corporate clients does involve the services of private quantity surveyor in project execution when necessary. Moreover, all the clients operated within the same construction environment in Nigeria. Consequently, based on the above explanation, there is possibility that they had the same experience with regards to the occurrence of risk factors in their cash flow forecast. Moreover, there was no statistically significant difference obtained in the occurrence of all risk factors in clients' cash flow forecast based on the project type which implied that all the respondents experienced the occurrence of risk factors in clients' cash flow forecast in the same way. This might be anticipated due to limitation in term of the grouping method employed, since the project grouping considered in this case (public and private) can also be sub-grouped according to the purpose of the proposed project like residential, office, educational, religious, e.t.c. Further sub-groupings may have remarkable effect on the respondents' experience of frequency of risk occurrence of all the risk factors when predicting cash flow.

There was no statistical relationship between procurement method and occurrence of all risk factors in clients' cash flow forecast. This gave an indication that all the respondents viewed the occurrence of risk factors clients' cash flow forecast in the same way even when different procurement methods were considered. This may be due to the fact that the methods of procurement observed are interwoven, in which case, design and build or even project management may contain element of traditional approach. Therefore, there is tendency that the risk factors occurred the same way regardless of difference in the procurement method operated by the respondents. In addition, project duration had no influence on the frequency of occurrence of all risk factors in clients' cash flow forecast which connoted that occurrence of risk factors was experienced by the surveyed clients in the same way while forecasting cash flow. They did not consider variations in project duration to produce significant difference in the occurrence of risk factors with respect to clients' cash flow forecast. This may be as a result of the nature of construction project and the industry (Kwakye, 1997 and Ashworth and Hogg, 2002), in which it is difficult to find two projects that are very identical. Hence, many other factors may be considered before a significant difference could be

experienced in the relation to issues which include risk. The occurrence of risk factors in clients' cash flow forecast was the same despite difference in project values. A statistically significant difference was obtained in the frequency of occurrence of all risk factors on the basis of project value, that is, the difference in the occurrence of risk factors in clients' cash flow forecast can be attributed to project value. This indicated that occurrence of all the risk factors in clients' cash flow forecast will not be the same for projects of different value categorization. This may be ascribed to the fact that highly expensive projects are prone to more risk and this occurred more frequently than less expensive projects. This result was based on all the individual risk factors. This followed Sidwell and Rumball (1982) who concluded that project value groupings could improve the predictive ability of cash flow.

The above discussion was on all the risk factors, on the other hand, considering the reduced risk factors, client type, project type, procurement method and project duration had no significant difference in the occurrence of the reduced risk factors in clients' cash flow forecast. This implied that occurrence of the reduced risk factors was observed to be the same except, in the case of project value where a significant relationship was established between the occurrence of nature of the project and tendering related factors in clients' cash flow forecast. This may be due to the fact that nature of the project in terms of its complexity and other characteristics, in most cases, determine its value or cost. Complex structures would be expensive and consequently affect the method employed in selecting the contractor (tendering method). For instance, complex structure will involve specialist's skill and equipment. In this case, open method of tendering may not be proper in selecting the appropriate contractor for the project execution whereas any simple structure can make use of any tendering method based on the choice of the client. Therefore, one may expect that significant difference will be observed in their reaction to risk. Large and complex project would be more prone to risk than small project of simple design (Layrea, 2008). This study is in agreement with literature reviewed that certain groupings need to be considered when predicting the cash flow (Peter, 1984; Kaka and Dawood, 2000, Odeyinka and Kaka, 2005; Odeyinka, 2003 and Odeyinka et al., 2008). However, Peter (1984) and Kaka and Dawood (2000)'s submission revealed that contract duration had influence on cash flow prediction while Dawood (2000), Odeyinka and Kaka (2005), Odeyinka (2003) and Odeyinka et al. (2008) as well, concluded that occurrence of risk factors in contractors' cash flow forecast should consider procurement method.

### **Risk impact**

The result of ANOVA proved that none of the project characteristics examined produced any significant

difference in the impact of occurrence of all the risk factors while forecasting cash flow clients. This means that, all the risk factors affected clients' cash flow forecast the same way regardless of the highlighted groupings. Odeyinka and Lowe (2000), Odeyinka (2003) and Odeyinka et al. (2008) worked on contractors' cash flow forecast and observed significant difference in the impact of risk based on the type of firm and procurement method. The difference in their results and this study may be due to the difference in the focus of the research, in terms of the respondents surveyed, while the aforementioned authors focused contractors, this study targeted construction clients. Based on this, there is likelihood of diversity in the expected result. However, when reduced factors were considered, their impact on the clients' cash flow forecast was different when project categorization was considered. Impact of valuation assessment on client's cash flow forecast was observed to be different based on the project type and procurement method. Valuation assessment is very important but its effect may not be obvious until the construction progresses and it may be detrimental if it is not properly managed. Valuation assessment consists of provision of interim valuation payment and currency of cost data on Table 6. Delay in valuation payment which may be as a result of faulty data (site/physical measurement and others) will have negative effect on the project. Also, type of project or procurement method employed may be part of the contributing factors; therefore, the result is well expected and conformed with Lowe (1987) who recognized project type and valuation assessment as important factors in achieving accurate client cash flow forecast.

## CONCLUSION

This paper examined the influence of project characteristics on the risk experience in the course of predicting cash flow by Nigerian clients. Five of the project characteristics namely; client type, project type, procurement method, project duration and project value were focused and their relationship with individual risk factors and few significant ones were investigated. The result revealed that none of the project characteristics had influence on the occurrence of individual risk factors associated with clients' cash flow forecast except project value. Occurrence of the two of the reduced risk factors (nature of the project and tendering related factor) were experienced in different way when project was categorized by value or cost. There was no statistical significant relationship between project characteristics and impact of individual risk factors while a statistical significant relationship was obtained between impact of one of the reduced risk factor (valuation assessment) when different project types and procurement methods were considered. The paper, therefore, concluded that

project characteristics had influence on the assessment of risk occurrence and impact at cash flow management stages although in different ways, occurrence of individual risk will be different when different project values is considered while different project types and procurement methods will produce different impact of valuation assessment as a risk factor associated with client cash flow. The result of this study established the need for due consideration of project characteristics during risk management of project at early stage especially cash flow preparation stage by the clients. The paper limited to consideration of individual project characteristics, further interaction of two or more of the project characteristics and their influence on risk can be investigated.

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