

PROJECT FUNDS MANAGEMENT FOR OPTIMAL COST CONTROL

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ABSTRACT

Various options are available for funding of projects, depending on the financial antecedents of the project promoter. Most states and the Federal Government of Nigeria depend on monthly allocations from the Federation Account as the major source of project funds. In a few instances, bulk funds may be available from financiers such as multilateral development agencies, the banks or the stock market. This paper examines the effect of adopting particular funding arrangements on the final cost of projects. It recommends that project-executing departments should do more financial analysis before committing their organisations to a particular mode of funding. Advance payment should be given but these must be tied to aspects of the project so that the client can benefit optimally from the funding arrangement. Contractors also need to seriously consider how their funds are applied so that they can increase their profitability.

INTRODUCTION

Project funding in the Nigerian public sector has often been a source of concern to development economists and engineers. As a result of inadequate budgeting culture, projects get started without adequate financial provision and thus get abandoned before completion. Because most state governments and even the Federal Government depend on the monthly allocations from the Federation Account, funding of projects often tend to follow the trends at the monthly allocation meetings. Whenever earnings from our monoculture product, crude oil, fall below expectations, project funds also tend to go the same way. Contractors and consultants are not paid in time and vital machinery or plant, which should have been imported in advance, fell to get to site according to schedule. When economic projects such as steel plants, fertilizer complexes and similar facilities get abandoned, much money that could have been put to productive use gets tied down as reinforced concrete on these sites.

One credit that cannot be taken from the General Sanni Abacha government in Nigeria is on the timely completion of the first phase of the **Liquefied Natural Gas Complex in Bonny**. It is on record that the government paid the total component of the Federal Government contribution of about US\$4billion to that project at the beginning of the project. This encouraged other investors to contribute their shares and the project thus became one of those rare government mega projects that get completed on schedule and within budget.

Fine[1] has stated that economic analysis of projects is a problem of the middle class. Those who are as rich as Croesus [the upper class] do not bother as they can afford any option. For those that are so poor that they cannot afford any of the option, they need not bother as such an exercise will be purely academic. Nunnally [2] reports that statistics compiled by Dun and Bradstreet on construction company failure indicates that the four major factors of inadequate financing, underestimating costs, inadequate cost accounting, and poor management account for over 80% of all failure. He advised that the financial management of a construction project should be given equal attention as the technical management.

The issue of project funding has been of interest to Nigerian professionals in the construction industry. Of particular interest has been what to do with mobilisation advances paid out when contracts are awarded. In 2001, the Federal Ministry of Finance, Abuja [3] came up with a circular in which made provision for mobilisation advances of up to 25% of the contract sum to be paid to the contractor. This was subject to the condition that **“payment of such mobilisation fee shall be effected upon written application and an unconditional Bank Guarantee for equivalent amount valid until the goods are supplied or until the mobilisation advance has been repaid in the case of works contract. Only unconditional Bank Guarantee issued by reputable banks should be accepted.”**

Price fluctuation in construction projects can sometimes be predicted with a reasonable degree of accuracy. In October 2003 when the policy of deregulation of petroleum products was implemented, cost increase were expected and it turned out to be so. The price of cement went up from about N700 to the present cost of more than N1100, more than 50% increase. If administration of President Obasanjo presses on with complete deregulation of the downstream sector of oil industry, it is likely that the price of cement may hit N1500 or above before the end of the year. Any client who wishes to complete projects without

excessive cost increase needs to take local socio-political developments serious and take action as the situation may demand. What N1million can achieve now may not be possible by the end of the year.

In this paper, two modes of funding of projects are presented through practical applications to a project. These are bulk provision of funds at the commencement of the project and monthly provision of amount required to cover the interim payment for the month. Depending on the interest rate operating within the environment, the relative profitability of each option is shown.

FUNDING THROUGH INITIAL BULK PROVISION

Under this arrangement, the client or promoter makes available in his bank account a sum of money equal to the amount required to complete the project bearing in mind the interest rate prevalent during the period of project execution.

Let the amount available for the prosecution of a contract at the beginning of a month be A_m , where m is the month in question. If the prevailing interest rate is $r\%$ per month, the amount available at the end of the month just before the interim payment for the month is $A_m[1 + 0.01r]$. If P_m is the amount paid out on the contract at the

end of month m , then P_m is the aggregation of the amount due within the month on each item of the contract such that :

$$P_m = \sum_{i=1}^n C_i \dots\dots\dots [1]$$

where C_i = cost of executing item i within the month;

and n = number of items in the contract.

For any month m , the amount available at the beginning of the next month is A_{m+1} and can be obtained from:

$$A_m[1 + 0.01r] - P_m = A_{m+1} \dots\dots\dots [2]$$

At the end of the first month, the amount available, A_2 , available at the commencement of the second month is :

$$A_2 = A_1[1 + 0.01r] - P_1 \dots\dots\dots [3]$$

If the total amount available for the project is to be paid out at the end of the project in month d , then for the last two months of the project:

$$A_{d-1}[1 + 0.01r] - P_{d-1} = A_d \dots\dots\dots [4]$$

$$\text{and } A_d[1 + 0.01r] - P_d = 0.0 \dots\dots\dots [5]$$

Solving equations [5] and then [4] gives the values of A_d and A_{d-1} as:

$$A_d = \frac{P_d}{[1 + 0.01r]} \dots\dots\dots[6]$$

$$A_{d-1} = \frac{P_{d-1}}{[1 + 0.01r]} + \frac{P_d}{[1 + 0.01r]^2} \dots\dots[7]$$

Similarly, it can be shown that the amount required at the commencement of a project, A_1 , is given by:

$$A_1 = \frac{P_1}{[1 + 0.01r]} + \frac{P_2}{[1 + 0.01r]^2} + \frac{P_d}{[1 + 0.01r]^d} \dots\dots[8]$$

The values of P can be obtained from the monthly cost schedule for the project while the prevailing interest rate [which varies from bank to bank] is the one applicable at the client's bank. If the client borrowed A_1 from a financier at a monthly interest of $b\%$, the amount $[R_T]$ to be refunded at the end of the project in d months is

$$R_T = A_1[1 + 0.01b]^d \dots\dots[9]$$

FUNDING THROUGH MONTHLY INJECTION OF FUNDS

Suppose the client is only interested in collecting from his bank just enough money to settle the interim payment P_m at the end of each month, he does not leave any balance to yield interest for him. At the end of the first month, the amount he borrows at the bank's lending rate of $b\%$ per

month is P_1 . This amount will be owed for $[d - 1]$ months and what he will refund to the bank is $P_1[1 + 0.01b]^{d-1}$. Similarly, it can be shown that the total amount he needs to refund at the end of the project in d months is:

$$R_T = \sum_{m=1}^d P_m[1 + 0.01b]^{d-m} \dots\dots\dots[10]$$

and
 n

$$P_m = \sum_{i=1}^n C_i \dots\dots\dots[11]$$

where C_i = cost of executing item i within the month;

and n = number of items in the contract.

FUNDING THROUGH ADVANCE PAYMENT [WITH STRINGS ATTACHED] AND MONTHLY INJECTION OF FUNDS

Under this funding arrangement, the client determines, after negotiations with the contractor, how much advance payment he should make to the contractor on certain items so that there will be no fluctuation claims throughout the duration of the project. What he now pays as monthly interim payments to the contractor is the difference between the total contract sum and the advance payment.

If the advance payment is D and the deduction to be effected each month is D_m , it can be shown that the total amount he needs to refund at the end of the project in d months is:

$$R_f = \left[\sum_{m=1}^d P_m - D_m \right] [1 + 0.01b]^d + \sum_{m=1}^d P'_m [1 + 0.01b]^{d-m} \quad [12]$$

and

$$P'_m = \sum_{i=1}^n C'_i \quad [13]$$

where C'_i = revised cost of executing item i within the month;

and n = number of items in the contract.

C'_i is obtainable from C_i by subtracting the equivalent amount covered by the advanced payment for the month.

NUMERICAL EXAMPLE

SCHEME 1 – NO PRICE FLUCTUATION AND ADVANCE PAYMENT

In **Table 1**, there is no fluctuation in prices and no advance payment is made. The total initial cost of the project at the time of award is N195million and the costs of the eight main activities are superimposed on the duration. Row 9 shows the monthly financial requirement of the project $[P_m]$, assuming no fluctuation in prices. What the client

pays at the end of the project is the same as the initial contract sum.

SCHEME 2 – PRICE FLUCTUATION OCCURS BUT NO ADVANCE PAYMENT

In **Table 2**, there are fluctuations in prices of 50% for concrete work and 20% for electrical work and no advance payment is made. The total initial cost of the project at the time of award is N195million and the costs of the eight main activities are superimposed on the duration. Row 9 shows the monthly financial requirement of the project $[P_m]$, with fluctuation in prices. The client now pays out a total of N240.5million by the time the project is completed.

SCHEME 3 – PRICE FLUCTUATION AND ADVANCE PAYMENT

In **Table 3**, the client, after discussing with the contractor pays 80% of the initial costs of concrete work [N60million] and electrical work [N32million] in order to ensure that there will be no price fluctuations for the two items throughout the duration of the project. The total amount paid to the contractor is still N195million even though the cash flow is substantially altered by the payment of N92million advance.

FINANCIAL ANALYSIS OF OPTIONS

Figure 1 shows the amount to be refunded to the bank by the client at the completion of the project. It is very clear that it is cheaper for the client to obtain monthly loans to settle interim payments instead of taking a bulk loan at the commencement of the project. This option remains cheaper than taking bulk loans for all interest rates except when the unexpected happens and the lending rate is equal to the deposit rate. When there are cost fluctuations, the trend does not differ.

If the client makes an advance payment for a project where cost fluctuations are expected, it makes sense for such an advance to be tied to specific items of the project which are likely to be worst affected by fluctuation. Figure 2 shows the effect of using the N92million advance to cover initial 80% of the costs of concrete works and electrical works. As mirrored on Table 4, it can be seen that this option remains cheaper for all interest rates considered.

STRINGS	NO STRINGS
218.46	259.72
226.92	267.21
235.72	274.9
244.87	282.82
254.40	290.96

CONCLUSIONS

From the analysis presented in this paper, it is obvious that more attention needs to be paid to the issue of project funding. Even when clients has sufficient personal or cooperate funds for the project, detailed funding arrangement needs to be considered to ensure that optimum use is made of such funds. The practice of mobilisation advances on project can be beneficial to both client and the contractor. For the client, he can control cost escalations through carefully directing the contractor on how the advances should be applied. For the contractor, his profitability can be enhanced through careful application of mobilisation advance received fro client. It makes sense for him to purchase some key materials in advance, even if provision is made for fluctuation of prices in the project.

REFERENCES

1. Fine, B. [1981] Construction Management Laboratory Manual, Fine, Curtis and Gross, London;
2. Nunnally, S. W. [1998], Construction Methods and Management, Prentice Hall, New Jersey, 4th Edition, p.499;
3. Federal Ministry of Finance [2001], Circular No. F15775, June 27, 2001.

TABLE 1 : FINANCIAL SCHEDULE FOR BUILDING PROJECT WITH NO COST FLUCTUATION THROUGHOUT THE DURATION AND NO ADVANCE PAYMENT.

S/N	DESCRIPTION OF WORK ITEM EXECUTED	DURATION [IN MONTHS] OF WORK ITEM EXECUTED AND AMOUNT EXPENDED [Nm]												TOTAL AMOUNT EXPENDED ON WORK ITEM [Nm]
		1	2	3	4	5	6	7	8	9	10	11	12	
1	SUBSTRUCTURE	15	15											30.00
2	CONCRETING OF FRAME/BLOCKWORK			25	25	25								75.00
3	ROOFING						5	5						10.00
4	ELECTRICAL WORK					10		10	10	10				40.00
5	MECHANICAL WORK					5		5	5	5				20.00
6	FITTINGS/FIXTURES								2	2				4.00
7	WALL/FLOOR/CEILING									4	4	4		12.00
8	PAINTING/DECORATION											2	2	4.00
9	TOTAL COST WITHIN MONTH [P_m]	15	15	25	25	40	5	20	17	21	4	6	2	195.00

TABLE 2 : FINANCIAL SCHEDULE FOR BUILDING PROJECT WITH 50% FLUCTUATION IN CONCRETE WORK AND 20% IN ELECTRICAL WORK DURING THE DURATION BUT NO ADVANCE PAYMENT

S/N	DESCRIPTION OF WORK ITEM EXECUTED	DURATION [IN MONTHS] OF WORK ITEM EXECUTED AND AMOUNT EXPENDED [Nm]												TOTAL AMOUNT EXPENDED ON WORK ITEM [Nm]
		1	2	3	4	5	6	7	8	9	10	11	12	
1	SUBSTRUCTURE	15	15											30.00
2	CONCRETING OF FRAME/BLOCKWORK			37.5	37.5	37.5								112.5
3	ROOFING						5	5						10.00
4	ELECTRICAL WORK					12		12	12	12				48.00
5	MECHANICAL WORK					5		5	5	5				20.00
6	FITTINGS/FIXTURES								2	2				4.00
7	WALL/FLOOR/CEILING									4	4	4		12.00
8	PAINTING/DECORATION											2	2	4.00
9	TOTAL COST WITHIN MONTH [P_m]	15	15	37.5	37.5	54.5	5	22	19	23	4	6	2	240.5

TABLE 3: FINANCIAL SCHEDULE FOR BUILDING PROJECT WITH NO COST FLUCTUATION THROUGHOUT THE DURATION BECAUSE OF 80% ADVANCE PAYMENT FOR CONCRFETE WORK AND ELECTRICAL WORK.

S/N	DESCRIPTION OF WORK ITEM EXECUTED	DURATION [IN MONTHS] OF WORK ITEM EXECUTED AND AMOUNT EXPENDED [Nm]												TOTAL AMOUNT EXPENDED ON WORK ITEM [Nm]	
		0	1	2	3	4	5	6	7	8	9	10	11		12
	ADVANCE PAYMENT	92													92.00
1	SUBSTRUCTURE		15	15											30.00
2	CONCRETING OF FRAME/BLOCKWORK				5	5	5								15.00
3	ROOFING							5	5						10.00
4	ELECTRICAL WORK						2		2	2	2				8.00
5	MECHANICAL WORK						5		5	5	5				20.00
6	FITTINGS/FIXTURES									2	2				4.00
7	WALL/FLOOR/CEILING										4	4	4		12.00
8	PAINTING/DECORATION												2	2	4.00
9	TOTAL COST WITHIN MONTH [P _m]	92	15	15	5	5	12	5	12	9	13	4	6	2	95.00

TABLE 4 : AMOUNT REFUNDABLE AT END OF PROJECT USING TWO DIFFERENT FUNDING ARRANGEMENTS

BANK LENDING RATE [%]	AMOUNT REFUNDABLE WITH NO STRINGS ATTACHED [N]	AMOUNT REFUNDABLE WITH SPECIFIED USE OF ADVANCE PAYMENT[N]	DIFFERENCE [N]
[1]	[2]	[3]	[4]
15	259.72	218.46	41.26
20	267.21	226.92	40.29
25	274.9	235.72	39.18
30	282.82	244.87	37.95
35	290.96	254.40	36.56

