LAUTECH Journal of Civil and Environmental Studies
Volume 8, Issue 2; June, 2022
DOI: 10.36108/laujoces/2202.80.0220

Evaluation of price distribution of building elements in the Bills of Quantities of Locally Owned Construction Firms in South West Nigeria

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Submitted on: 14/02/2022 *Accepted on: 13/05/2022*

Abstract

It is important to diagnose locally-owned construction firms (LOCOFs) cash flow and hence their financial health through assessment of percentage cost allocation to various work items in the bills of quantities of new building projects. To this end, this paper analysed locally-owned construction firms' priced bill of quantities (BOQ) of awarded building projects in order to demonstrate the appropriateness of their cash flow management plan and techniques. This is with an aim of improving the performance of local firms. Sixty BOQ of new building projects awarded to various LOCOFs in year 2007 to 2015 were assessed. Cost allocated to major early and finishing building element work stages were identified, analysed and relevant inferences bothering on firms' financial plan and cash flow management techniques were discussed. The result showed that average percentage cost allocations for building preliminaries, substructure, frame structure, roof and finishes arranged in descending order had the highest cost allocation to building substructure (20.35%), finishes (12.98%), frame structure (12.31%), roof (12.08%) and preliminaries (2.85%). Also, 24 of the 60 BOQ had more than 50% of the contract sum allocated to building projects elements' early stages of work. This cash receipt and payment early advantage can be well utilised by applying a well thought out cash flow management plan and technique that will boost LOCOFs' working capital.

Keywords: Bill of Quantities, Building Element, Locally-owned Construction Firms, Cash Flow Management

Introduction

Financial factors influence on the viability of construction contractors can be assessed from their financial statement, cost control practices, cash flow management and pricing strategy among others (Hany *et al*., 2013; Burtonshaw-Gunn 2017; Palepu *et al*., 2020). Various authors observed that careful management of cash flow before and during construction operation can yield a significant contribution to working capital (Peterson, 2020), prevent construction delay (Fatoye, 2012), enhance smooth material supply (Saka and Mudi, 2007), prevent labour unrest, poor progress of work and company's liquidation (Marx, 2011; Omopariola *et al*., 2020). One of the most vital construction documents which serve as the basis for contractors' cost control practices, cash flow management and pricing strategy is the bill of quantities (BOQ).

It has been observed from literature that overvaluation and undervaluation in form of front-end loading and backend loading of the bill of quantities (BOQ) is one of the construction contractors' cash flow management strategies (Oladimeji and Aina, 2018; Adjei *et al*., 2018; Biruk *et al*., 2017; Nadeem et al., 2015). Hyari (2017) states that front end loading of the BOQ enable contractors have more money at the beginning of project. These studies indicated that contractors can be more viable when they properly utilise the BOQ cash flow management plan.

Other authors who were not focused on viability have underscored the importance of BOQ as having the ability to reveal and evaluate a project cash flow and pricing strategy before the commencement of construction activities through its priced BOQ, this is referred to as projects cash flow forecast (Andalib et al., 2018; Shash and Qarra, 2018). This fact was implied by Aziz 2013, Odeyinka *et al,* (2013) and Brook

(2016) who stated that the traditional approach to cash flow prediction usually involves the breakdown of BOQ in line with the contract programme to produce a profile. This could be expected to be reasonably precise provided that the BOQ is accurate and the contract program is complied with.

The BOQ which can be referred to as an individual project elemental financial plan document, enables all contractors tender for a contract, price on exactly the same information. It is subsequently widely used for post tender work such as: material scheduling, construction planning, cost analysis and cost planning. To this end, the BOQ can be used to assess contractors' cash flow management plan and techniques; this is the focus of this study. This paper analyses LOCOFs priced BOQ of awarded building projects in order to demonstrate the appropriateness of their cash flow management plan and techniques. Meanwhile, the locally owned construction firms in Nigeria are construction firms established under the enterprise promotion decree of 1972 and have no other home base but Nigeria. Their entire capital and any other proprietary interests in the enterprise are owned and controlled by Nigerian citizens or associations and most or all of their technical and managerial undertakings are manned by Nigerians (Olateju, 1991).

Materials and Methods

Seventy-nine (79) BOQ of locally owned construction firms awarded building construction contracts in year 2007 to 2015 by federal universities and federal universities teaching hospitals in three states (Lagos, Ondo and Osun) of the five states in Southwestern Nigeria were surveyed out of which 60 BOQ representing 76% of the total BOQ were accessed for this study. In this study, specific data extracted from the BOQs were takes as sum for early start stages and early middle stages generalised as early work stages (preliminaries, substructures, frame structures and roofs) and finishing stages (building finishes). Percentages and cumulated percentages allocated to each work item and group of items making up early work stages and finishing work stage were calculated. Also, highest, average and lowest percentage allocations and cumulative percentage allocation were evaluated and relevant deduction and inferences made on firms' BOQ cash flow plan and techniques.

Results and Discussion

Tables 1 to 9 show selected various projects' building elements of LOCOFs' BOQ financial plan starting right from the building contract preliminaries to the substructure, frame structure and roof for year 2007 to 2015. These identified early stage by stage items of work were used in this study to evaluate and demonstrate LOCOFs planned pattern of cash flow. Building finishes which are expectedly done at the later stage of building projects were selected by this study to also evaluate and demonstrate LOCOFs' pattern of cash flow at the later stage of the building projects. Note that building projects contract sum used in this section include contract contingencies of 5% to 10% where necessary and the mandatory 5% vat and tax by the Federal government.

The building element with the highest percentage cost allocation in the year 2015 showed in Table 1 was the frame structure (22.79%) while the highest on the average was the substructure element having 15.02%. The lowest and highest cumulative percentage cost allocations to the early work stages were 31.17% (No.3 with lowest contract sum) and 46.47% (No.4 with the highest contract sum). The average percentage cumulative cost to the early work stages which is also the lowest in all the years considered in this study was 41.41%. All the projects except one (No. 3) had cumulative percentage cost allocation to early work stages of more than 40%. This implies that in most of the building projects awarded, more than 40% cumulative percentage cost allocated for the contract sum were for the building preliminaries, substructure, frame structure and roof.

However, none of the projects had a 50% cumulative percentage cost allocated to these early stages of work. Project number 3 had the highest percentage cost allocation of 15.48% for finishes while the lowest percentage cost allocation (4.48%) for finishes assigned to project number 4. An observed low percentage cost allocation for finishes was assigned to the building projects with a very high contract sum while the project with a low contract sum had a high percentage cost allocation for finishes. This suggests the use of

front-end loading by the firm awarded the building project with the highest contract sum among other reasons not in the purview of this study.

Table 1: Selected Individual Building Elements of LOCOFs' BOQ Cost plan for 2015 Building Project Contracts Award

Project No.	**Project Sum(N) (%)**	**Prelimin. (N) % (cum.%)**	**Substruct. (N) % (cum.%)**	**Frame Str.(N) (cum.%)**	**Roof (N) % (cum.%)**	**Finishes(N) %**
1	106,108,078	2,840,000	10,142,470	23,420,520	8,846,111	15,972,260
	(100)	2.67 (2.67)	9.56 (12.23)	22.07 (34.31)	8.34 **(42.64)**	15.05
2	34,992,623	100,000	5,072,700	1,691,000	7,592,800	1,710,000
	(100)	0.29 (0.29)	14.50 (14.87)	4.83 (19.61)	21.70 **(41.31)**	4.89
3	26,015,631	500,000	3,868,400	1,218,000	2,662,540	4,027,200
	(100)	1.92 (1.92)	14.87 (16.79)	4.68 (21.47)	10.23 **(31.71)**	15.48
4	304,546,475	30,000	36,512,080	69,405,733	35,609,706	13,633,775
	(100)	0.01 (0.01)	11.99 (12.00)	22.79* (34.79)	11.69 **(46.48)**	4.48
5	214,863,689	8,590,000	42,637,640	32,931,000	10,996,050	10,580,755
	(100)	4.00 (4.00)	19.84 (23.84)	15.32 (39.17)	5.12 **(44.29)**	4.92
6	218,950,000	5,572,784	42,419,010	33,774,000	10,219,578	18,106,280
	(100)	2.55 (2.55)	19.37 (21.92)	15.42(37.34)	4.67 **(42.01)**	8.27
Average (%)		1.91	15.02 **	14.19	10.29	
Cumulative (%)		**1.91**	**16.93**	**31.12**	**41.41**	8.85

Building frame structure which had the highest percentage cost allocation in Table 1 also had the highest percentage cost allocation in Table 2 for the year 2014. The highest and the lowest cumulative percentage cost allocated to early work stages were 35.25% for project number 2 and 60.92% for project number 1 respectively. The average cumulative percentage cost allocated to the early work stages was 47.90% (Table 2). Three of the building projects' early work stages shown in Table 2 had a percentage cost allocation of more than 50%. Also, project number 6 with the highest contract sum (N372, 163,134) had more than 40% cumulative percentage cost allocated to its early work stages. A higher average cumulative percentage cost was allocated to the building projects early work stages in 2014 when compared to that of 2015. This suggests a better projects' cash flow for projects awarded in 2014 than that of 2015.

The average, highest and lowest percentage cost allocations for finishes are 14.86%, 20.98% and 6.92% respectively. Project six with the highest contract sum had the highest percentage cost allocation for finishes which suggests that it is possible to have a high-cost allocation for finishes in building projects with high contract sum. Contractors handling projects having cost allocations as presented in project 6 will be at a cash flow disadvantage especially if there is paucity of fund at the finishing stage (Peterson, 2020). Building Project abandonments due to paucity of fund are common occurrences in Nigeria (Adebisi *et al*., 2018).

Table 2: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2014 Building Project Contracts Award

Project No.	Project Sum(N) (%)	Prelimin.(N) % (cum.%)	Substruct.(N) % (cum.%)	Frame Str.(N) % (cum.%)	Roof (N) % (cum.%)	Finishes(N) %
1	179,453,028	12,710,070	23,959,490	50,650,300	22,008,680	23,014,440
	(100)	7.08 (7.08)	13.35 (20.43)	28.22 (48.65)	12.26 **(60.92)**	12.82
2	47,842,114	1,469,400	8,116,670	1,229,060	6,037,000	3,311,584
	(100)	3.07 (3.07)	16.97(20.04)	2.57(22.61)	12.62 **(35.23)**	6.92
3	84,577,023	2,850,000	14,799,665	1,229,100	18,731,500	12,437,860
	(100)	3.37 (3.37)	17.50(20.87)	1.45(22.32)	22.15 **(44.47)**	14.71
4	92,999,551	4,000,000	17,207,919	26,602,410	4,771,200	11,439,750
	(100)	4.30 (4.30)	18.50(22.80)	28.60* (51.40)	5.13 **(56.53)**	12.30
5	65,445,770	1,800,000	12,665,580	3,669,950	17,786,550	11,618,560
	(100)	2.75 (2.75)	19.35 (22.10)	5.61(27.71)	27.18 **(54.89)**	17.75
6	372,163,134	-	72,417,318	64,630,708	22,319,914	78,088,506
	(100)	0	19.46 (19.46)	17.36(36.82)	6.00 **(42.82)**	20.98
7	233,683,294	6,736,893	43,020,767	32,731,051	11,974,972	43,327,254
	(100)	2.88 (2.88)	17.65(21.29)	14.01(35.30)	5.12 **(40.42)**	18.54
Average (%)		3.35	17.65**	13.98	12.92	
Cumulative (%)		**3.35**	**21.00**	**34.98**	**47.90**	14.86

Financial plan for contract awarded in 2013 shown in Table 5 indicates that building substructure had the highest percentage elemental and average cost allocation of 33.30% (No.5) and 20.06% respectively. The lowest and highest cumulative percentage cost allocations were assigned to project number 3 (34.77%) and number 5(63.11%) while the average cumulative percentage cost allocation was 42.79%. Only one of the seven projects had a cumulative percentage cost allocation to early work stages of more than 50%. Project number 5 with the highest cumulative percentage cost allocation to early work stages is also having the highest percentage cost allocation of 9.71% for preliminaries which is the highest percentage allocation to preliminaries in all the years considered in this study. More than 40% of the contract sum was spent on building project preliminaries and foundation work which indicates a good cash flow plan advantage for the firm. The lowest, highest and average percentage cost allocation for finishes were 5.33% (No.1), 15.78% (No.7) and 11.42% respectively (Table 3).

Table 4 for the year 2012 showed that building substructure had the highest percentage cost and average cost allocations of 28.03% (No.6) and 17.47% respectively. The lowest, highest and average cumulative percentage cost allocations to the early work stages are: 35.27% (no.7), 56.18% (No.4) and 46.18% respectively. Only two out of seven of the projects attracted more than 50% cumulative cost allocations to the early work stages, these include project number 3 with the highest contract sum which had a cumulative cost allocation of 54.41%. This implies that a payment certificate of more than half of the contract sum is obtainable by firms that handled these two projects.

Table 3: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2013 Building Project Contracts Award

Project No.	Project Sum(N) (%)	Prelimin.(N) % (cum.%)	Substruct.(N) % (cum.%)	Frame Str.(N) % (cum.%)	Roof (N) % (cum.%)	Finishes(N) %
1	36,526,511	1,800,000	7,385,610	2,504,800	3,522,450	1,948,470
	(100)	4.92(4.92)	20.22 (25.15)	6.86 (32.01)	9.64 **(41.65)**	5.33
2	9,130,005	416,263	2,218,255	-	906,880	1,317,910
	(100)	4.56 (4.56)	24.30 (28.86)	0(28.86)	9.93 **(38.79)**	14.43
3	98,110,174	2,591,907	11,751,865	1,251,200	18,515,215	10,295,000
	(100)	2.64 (2.64)	11.97 (14.62)	1.28 (15.90)	18.87 **(34.77)**	10.49
4	37,657,865	0	6,346,810	2,329,100	6,187,800	4,431,700
	(100)	0	16.85 (16.85)	6.18 (23.04)	16.43 **(39.47)**	11.77
5	50,995,756	4,950,000	16,981,383	1,971,950	8,278,000	3,428,750
	(100)	9.71 (9.71)	33.30* (43.01)	3.87 (46.87)	16.23 **(63.11)**	6.72
6	27,869,635	1,500,000	4,107,405	1,290,000	3,387,250	4,294,057
	(100)	5.38 (5.38)	14.74 (20.12)	4.63 (24.75)	12.15 **(36.90)**	15.41
7	64,263,153	1,200,000	12,253,380	13,200,760	2,184,700	10,142,440
	(100)	1.87 (1.87)	19.07 (20.93)	20.54 (41.48)	3.40 **(44.88)**	15.78
Average (%)		4.16	20.06**	6.19	12.38	
Cumulative (%)		**4.16**	**24.22**	**30.41**	**42.79**	11.42

Table 4: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2012 Building Project Contracts Award

Project No.	Project Sum(N) (%)	Prelimin.(N) % (cum.%)	Substruct.(N) % (cum.%)	Frame Str.(N) % (cum.%)	Roof (N) % (cum.%)	Finishes(N) %
1	12,039,880		2,525,040	1,195,580	1,032,650	1,413,990
	(100)	-	20.97 (20.87)	9.93 (30.90)	8.58 **(39.48)**	11.74
2	9,851,825		2,439,870	1,195,580	1,032,650	1,413,990
	(100)	-	24.76 (24.76)	12.14 (36.90)	10.48 **(47.38)**	14.35
3	252,737,704	7,881,558	38,285,594	54,841,672	36,499,630	34,595,628
	(100)	3.12 (3.12)	15.15 (18.27)	21.70 (39.97)	14.44 **(54.41)**	13.69
4	62,709,450	3,600,000	10,098,910	11,848,320	8,584,261	8,032,289
	(100)	5.74 (5.74)	16.10 (21.85)	18.89 (40.74)	13.68 **(54.43)**	12.81
5	73,491,169	4,100,000	10,778,590	15,023,000	5,776,520	10,247,975
	(100)	5.58 (5.58)	14.67 (20.24)	20.44 (40.69)	7.86 **(48.55)**	13.94
6	100,479,954	2,500,000	10,433,180	28,170,890	2,832,300	11,146,095
	(100)	2.48 (2.48)	10.38 (12.87)	28.03* (40.91)	2.82 **(43.73)**	11.09
7	63,616,287	2,750,000	8,609,465	7,108,440	3,969,985	5,751,730
	(100)	4.32 (4.32)	13.53 (17.86)	11.17 (29.03)	6.24 **(35.27)**	9.04
Average (%)		3.04	16.51	17.47**	9.16	
Cumulative (%)		**3.04**	**19.55**	**37.01**	**46.18**	12.38

Meanwhile, all the percentage cost allocated to the finishes was less than 15%. This suggests that high percentage of the contract sums were allocated to building early stages of work and low percentages to later work stages. These building projects contract sums allocation cases are deemed advantageous to cash flow of LOCOFs building projects (Peterson, 2020).

Building project awarded in 2011 as seen in Table 5 showed the highest percentage cost allocation of 36.35% to substructure in project number 2 and the highest average allocation of 22.38% in all the projects considered in this study. The lowest, highest and average cumulative percentage cost allocations to the early work stages: 29.30% (No.6), 57.23% (No.4) and 44.94% respectively. Three projects including projects 1 and 2 whose contract sum were more than N200 million each had more than half of its contract sums allocated to the identified early construction stages. This implies that a payment certificate of more than half of the contract sum is obtainable by the firms handling these projects on completion of these early work stages. This also indicates a high financial allocation to these early work stages suggesting a good contribution to LOCOFs' cash flow at the early stages of work. The lowest, highest and average percentage cost allocation for finishes in the Table 5 are 1.64% (No.6), 24.67(No.3) and 14.20% respectively.

Table 5: Selected Individual Building Elements of LOCOFs' BOQ Cash Flow Plan for 2011 Building Project Contracts Award

Project No.	**Project Sum(N) (%)**	**Prelimin (N) % (cum.%)**	**Substruct (N) % (cum.%)**	**Frame Str.(N) % (cum.%)**	**Roof (N) % (cum.%)**	**Finishes(N) %**
1	246,542,826	11,500,000	45,931,000	15,121,700	51,204,753	44,729,942
	(100)	4.66 (4.66)	18.63 (23.30)	6.13 (29.43)	20.77 **(50.20)**	18.14
2	233,440,925	6,700,000	84,854,600	4,990,000	25,459,740	33,397,750
	(100)	2.87 (2.87)	36.35*(39.22)	2.14 (41.36)	10.91 **(52.26)**	14.31
3	68,076,564	833,333	14,776,010	9,228,840	7,495,233	16,795,650
	(100)	1.22 (1.22)	21.70 (22.93)	13.56 (36.49)	11.01 **(47.50)**	24.67
4	106,788,750	833,333	28,542,990	18,096,980	13,643,450	17,670,850
	(100)	0.78 (0.78)	26.72 (27.51)	16.94 (44.45)	12.78 **(57.23)**	16.55
5	40,839,765	833,333	7,157,765	643,600	18,360,150	4,032,150
	(100)	2.04 (2.04)	17.52 (19.57)	1.58 (21.14)	11.39* **(32.53)**	9.87
6	12,195,761	393,300	1,629,360	559,030	1,068,550	200,200
	(100)	3.22 (3.22)	13.36 (16.58)	4.58 (21.17)	8.76 **(29.93)**	1.64
Average (%)		2.47	22.38**	7.49	18.20	
Cumulative (%)		**2.47**	**24.85**	**32.34**	**44.94**	14.2

Building substructure had a highest percentage and highest average percentage cost allocations of 37.3% (No.12) and 26.72% as shown in Table 6 in the year 2010. The lowest, highest and average cumulative percentage cost allocations to the early work stages were: 34.30% (No.11), 65.16% (No.12) and 48.27% respectively. Project number 12 with very high-cost allocation may be due to the high percentage cost allocation for elaborate or specialized sub-structural work requirements. More than 40% of the contract sums allocated in all the building projects except one (No.11) were assigned to the building project early work stages. More than one-third of the projects required a payment certificate of more than 50% on completion of the identified early work stages which implies that a high cost was allocated to the early work stages. The lowest percentage cost allocation of 1.17% (No.8) for finishes was the lowest assessed for all the years in this study. As noted earlier, this is expected to significantly enhanced LOCOFs' cash flow for the building projects especially at the early work stages. Meanwhile, the highest and average

percentage cost allocation for finishes were 18.34 (No.7) and 13.27 respectively and there was no cost allocated to preliminaries for project number 10.

Table 6: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2010 Building Project Contracts Award

Project No.	Project Sum(N) (%)	Prelimin (N) % (cum.%)	Substruc.(N) % (cum.%)	Frame Str.(N) % (cum.%)	Roof (N) % (cum.%)	Finishes(N) %
1	36,764,127	1,420,000	5,945,202	4,774,951	2,725,615	3,443,136
	(100)	3.86 (3.86)	16.17 (20.03)	12.99 (33.02)	7.41 **(40.43)**	9.37
2	69,021,933	1,650,000	10,033,500	14,285,000	5,153,190	10,873,650
	(100)	2.39 (2.39)	14.54 (16.93)	20.70 (37.62)	7.47 **(45.09)**	15.75
3	111,839,637	2,250,000	21,572,085	34,837,420	3,877,930	16,247,095
	(100)	2.01 (2.01)	19.29 (21.30)	31.15 (52.45)	3.47 **(55.92)**	14.53
4	54,415,287	4,050,000	10,873,156	11,158,968	3,928,950	7,481,612
	(100)	7.44 (7.44)	19.99 (27.42)	20.51 (47.93)	7.22 **(55.15)**	13.75
5	31,776,723	1,500,000	8,026,500	2,753,250	2,252,150	4,642,467
	(100)	4.72 (4.72)	25.26 (29.98)	8.66 (38.64)	7.09 **(45.73)**	14.61
6	64,397,523	1,000,000	16,430,099	12,208,344	3,803,690	11,124,580
	(100)	1.55 (1.55)	25.51 (27.07)	18.96 (46.02)	5.91 **(51.93)**	17.27
7	55,383,983	1,000,000	19,829,161	7,627,388	2,760,210	10,157,700
	(100)	1.81 (1.81)	35.80 (37.61)	13.77 (51.38)	4.98 **(56.36)**	18.34
8	44,296,482	1,000,000	16,525,554	903,132	1,618,638	518,950
	(100)	2.26(2.26)	37.31(39.56)	2.04 (41.60)	3.65 **(45.25)**	1.17
9	66,230,550	1,000,000	8,485,460	11,060,600	6,110,200	11,662,500
	(100)	1.51 (1.51)	12.81 (14.32)	16.70 (31.02)	9.23 **(40.25)**	17.61
10	35,142,465	-	8,926,310	2,272,620	4,154,200	5,212,850
	(100)	0	25.40 (25.40)	6.47 (31.87)	11.82 **(43.69)**	14.83
11	47,408,575	500,000	9,450,205	1,872,650	4,437,145	4,925,020
	(100)	1.06 (1.06)	19.93 (20.99)	3.95 (24.94)	9.36 **(34.30)**	10.39
12	22,144,586	500,000	8,355,349	1,670,100	3,903,100	2,561,700
	(100)	2.26 (2.26)	37.73* (39.99)	7.54 (47.53)	17.63 **(65.16)**	11.57
Average (%)		2.57	24.14**	13.62	7.94	
Cumulative (%)		**2.57**	**26.72**	**40.34**	**48.27**	13.27

Roof structure of project number 5 shown in Table 7 for the year 2009 had the highest percentage elemental cost allocation of 22.82% while substructure had the highest percentage elemental average cost allocation of 18.40%. The lowest, highest and average cumulative percentage cost allocations to the early building project work stages were: 34.25% (No.3), 53.81% (No.4) and 44.32% respectively. Two of the 5 building projects had more than 50% cumulative percentage cost allocation to the selected early building project stages. This implied that more than 50% payments were made to firms on completion of the early work stages of these building projects (Table 7). The lowest, highest and average percentage cost allocations for finishes are 3.40% (No. 4), 21.15% (No.1) and 13.56% respectively. Cash flow advantage at early work stages is noteworthy, especially in building projects 4 and 5.

Table 7: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2009 Building Project Contracts Award

Project No.	Project Sum(N) (%)	Prelimin.(N) % (cum.%)	Substruct.(N) % (cum.%)	Frame Str.(N) % (cum.%)	Roof (N)% (cum.%)	Finishes(N) %
1	116,917,400	2,500,000	18,518,700	7,636,000	18,297,200	25,153,200
	(100)	2.14 (2.14)	15.84 (17.98)	6.53 (24.51)	15.65 **(40.16)**	21.51
2	226,733,790	16,300,000	34,228,140	12,454,500	31,250,000	43,421,800
	(100)	7.19 (7.19)	15.10 (22.29)	5.49 (27.78)	13.78 **(41.56)**	19.15
3	247,482,860	3,943,000	33,128,300	10,439,000	37,256,000	43,206,560
	(100)	1.59 (1.59)	13.39 (14.98)	4.21 (19.20)	15.05 **(34.25)**	17.46
4	258,344,910	-	85,113,320	21,197,000	32,706,000	8,776,750
	(100)	0	32.95 (32.95	8.20 (41.15)	12.66 **(53.81)**	3.40
5	66,868,033	2,415,000	9,867,860	7,109,000	15,256,700	4,208,650
	(100)	3.61 (3.61)	14.75 (18.37)	10.63 (29.00)	22.82* **(51.82)**	6.29
Average (%)		2.91	18.40**	7.02	15.99	
Cumulative (%)		**2.91**	**21.31**	**28.33**	**44.32**	13.56

Locally owned construction firms BOQ financial plan for 2008 contract award in Table 8 shows that building substructure of project number 4 had the highest elemental percentage allocation of 51.85%, and it is also the highest allocation for all the years considered in this study. In the same vein, the highest cumulative percentage of 81.44% (No.7) to the early work stages is also the highest considered in this study. In addition, Project number 1 and 4 in Table 8 with a cumulative percentage of 76.53% and 72.37% for the early work stages are the second and third rated cumulative allocation in this study. These indicate that firms handling these building projects are entitled to more than 70% percentage payment certificate on completion of the early work stages of the building projects. These suggest a very high percentage cost allocation to these early stages of work and should serve as a significant boost to firms' cash flow at the early stage of work. It is interesting to note that this Table also had the lowest cumulative percentage cost allocation of 29.20% (No.5) in comparison to all the other Tables in this section. This ascertains the possibility of a low-cost allocation to early work stages of building projects. This implies that the numerous high cumulative percentage cost allocation identified in the previous discussion may not only be because of the types of building project alone but may also be a deliberate attempt by firms in making fund available at commencement and during the early stages` of the projects. This is a major aim of some of the various cash flow management techniques (Cattel *et al*., 2008; Oladimeji and Aina, 2018; Peterson, 2020). The highest cost allocation for finishes in this study is 26.12% of project number 3 (Table 8).

Lastly, two projects were considered in Table 9 and it showed that the financial allocation to the selected element in 2007 had a cumulative percentage average for early work stages of 46.62%. Project number 2 had more than half of its contract sum allocated to the building project identified early work stages. The average and sum total of all projects for each of the Tables for each year in the study were summarised in Table 10. The grand average percentage cost allocations for building preliminaries, substructure, frame structure roof and finishes arranged in descending order of percentage showed that the highest cost allocation was the substructure (20.35%), followed by finishes (12.98%), frame structure (12.31%), roof (12.08%) and preliminaries (2.85%).

Table 8: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2008 Building Project Contracts Award

Project No.	Project Sum(N) (%)	Prelimin.(N) % (cum.%)	Substruct.(N) % (cum.%)	Frame Str.(N) % (cum.%)	Roof (N) % (cum.%)	Finishes(N) %
1	15,267,726	850,000	4,986,255	589,160	5,259,010	1,082,690
	(100)	5.57 (5.57)	32.66 (38.23)	3.86 (42.08)	34.45 **(76.53)**	7.09
2	26,047,170	500,000	4,604,170	4,959,050	2,500,150	5,122,450
	(100)	1.92 (1.92)	17.68 (19.60)	19.04 (38.63)	9.60 **(48.23)**	19.67
3	58,015,485	2,800,000	13,466,540	6,638,250	7,106,270	15,153,655
	(100)	4.83 (4.83)	23.21 (28.04)	11.44 (39.48)	12.25 **(51.73)**	26.12
4	27,529,107	245,000	14,274,200	2,123,280	3,281,600	4,666,300
	(100)	0.89 (0.89)	51.85* (52.74)	7.71 (60.45)	11.92 **(72.37)**	16.95
5	49,359,914	453,000	5,647,630	1,701,720	6,610,500	4,009,240
	(100)	0.92 (0.92)	11.44 (12.36)	3.45 (15.81)	13.39 **(29.2)**	8.12
6	55,497,992		10,050,950	10,086,150	8,210,344	6,222,250
	(100)	0	18.11 (18.11)	18.17 (36.28)	14.79 **(51.08)**	11.21
7	48,454,844	1,188,129	13,945,500	10,844,352	13,483,340	NA
	(100)	2.45 (2.45)	28.78 (31.23)	22.38 (56.61)	27.83 **(81.44)**	
8	155,712,247	1,686,000	20,168,492	43,406,183	5,517,349	NA
	(100)	1.08 (1.08)	12.95 (14.04)	27.88 (41.91)	3.54 **(45.45)**	
Average (%)		2.21	24.56**	14.24	15.31	
Cumulative (%)		**2.21**	**26.79**	**41.03**	**56.35**	13.73

Table 9: Selected Individual Building Elements of LOCOFs' BOQ Cost Plan for 2007Building Project Contracts Award

Project No.	Project Sum (N) (%)	Prelimin. (N) (cum.%)	Substruct. (N) (cum. %)	Frame Str. (N) (cum. %)	Roof (N) % (cum. %)	Finishes (N) %
1	11,762,717	720,000	2,001,440	1,205,100	817,000	2,153,400
		6.12 (6.12)	(17.02) 23.14	(10.24)33.38	6.95 **(40.33)**	18.3
2	29,926,735	450,000	6,419,405	6,619,300	2,349,100	4,836,050
		1.50 (1.50)	21.45 (22.95)	22.12 (45.07)	7.85 **(52.92)**	16.16
Average (%)	41,689,452	3.81	19.23	16.18	7.40	
Cumulative (%)	**3.81**	**23.05**	**39.23**	**46.62**	17.23	

The preliminaries percentage average cost of 2.85% suggested that percentage cost allocation to preliminary items was low when compared to the average observed by Inyang (2013) who observed that an average cost of preliminaries for a low rise building and for a high-rise building is 5.13% and 4.12% respectively. The grand average percentage cumulative cost for the early work stages is estimated to cost about half (47.58%) of the contract sum for all the years under consideration. Twenty-four of the 60 building contracts had more than 50% of the contract sum allocated to the early stages of work which indicate that in every three projects, one project required a payment of more than half the project contract sum at the end of the projects' early work stages. This in summary is cash flow advantageous to LOCOFs especially at the early work stages when cost of construction projects' working capital is highly essential (Peterson, 2020).

Table 10: LOCOFs' BOQ Cost Plan Summary for Selected Individual Building Elements for 2007- 2015 Building Project Contracts Award

Year	Project Total Sum (N)	Prelim. (%) Average	Substru (%) Average	Frame Str.(%) Average	Roof (%) Average	Cumlative. to roof Average (%)	Cum. to roof Without prelimin . (%)	Finishes %
2007	41,689,452	3.81	19.23	16.18	7.4	46.62	42.81	8.85
2008	394,569,589	2.21	24.56	14.24	15.31	56.35	54.14	14.86
2009	916,346,993	2.91	18.40	7.02	15.99	41.41	38.50	11.42
2010	638,821,871	2.57	24.14	13.62	7.69	48.27	45.70	12.38
2011	707,884,591	2.47	22.38	7.49	18.20	44.94	42.47	14.2
2012	574,926,269	3.04	16.51	17.47	9.16	46.18	43.14	13.27
2013	324,553,099	4.16	20.06	6.19	12.38	42.79	38.63	13.56
2014	1,076,163,914	3.35	17.65	13.98	12.92	47.9	44.55	13.73
2015	905,476,496	1.91	15.02	14.19	10.29	41.41	39.50	17.23
Total and Average (%)	**5,580,432,274**	**2.85**	**20.35**	**12.31**	**12.08**	**46.21**	**43.36**	**12.98**

Conclusions

The significant variation observed in financial allocation to elements in the BOQ of each project for each year may not only be due to the variation in magnitude and type of project among other reasons. It is also as a result of contractors' long-term experiences, intuitions and personal biases in allocating cost with the intent to boost positive cash flow especially at the early stages of building construction work characterise by active construction operations. Firms' can take advantage of the possibility of price loading by applying a well thought out cash flow management plan and technique recommended in construction management literature to boost their top line revenue rather than maximizing their bottom-line profit (Cattel *et al*., 2008). Although this should be done in the ambit of good professional ethics. Evaluation of various new building projects BOQ in this study shows a significant variation in percentage cost allocation to the selected building elements at different stages.

Although this study assessed trends and pattern in BOQ cost allocations, it however showed the uniqueness of each project. It was also observed that some new building project had no preliminaries while in some cases the percentage allocation seems very small in comparison to the contract sum. Meanwhile, there is the need for adequate information on new building design, site condition and location, notes on peculiar contract conditions, restricted site and security in the preparation of the BOQ. In addition, information on the magnitude and period of contract, plant and equipment requirements, obligations and restriction imposed by client are also necessary for a well-planned BOQ individual project elemental financial plan allocation.

To this end, this study recommends that LOCOFs ensure proficient, prudent and timely management of construction resources during the early stages of building project so as to reap the advantage of early payment of a very substantial percentage of the project contract sum. This will reduce the risk in the rise of cost of material and labour and abandonment of building projects due to insufficient capital by client/government at later stages of new building projects. Local firms should ensure a long term and consistent participation in construction bidding and execution activity as such experience, intuitions, knowledge and relationship gained overtime sustains a significant influence in firms' BOQ cash flow planning and techniques.

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