

# 1 Investigating the Criticalities of Corruption Forms in 2 Infrastructure Procurement in the Developing Regions

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9 **Abstract.** This study examines the criticalities of the forms of corruption in  
10 infrastructure project procurement. The study employed non-probabilistic  
11 sampling techniques to reach 62 experts actively involved in the processes of  
12 infrastructure procurement within the context of developing regions. The  
13 variables captured under the constructs of the forms of corruption were identified  
14 via the review of pertinent literature. They were empirically examined after being  
15 evaluated by the experts involved in the survey. A total of twenty-seven variables  
16 were identified and examined. From the analysis, bribery, lobbying, and price-  
17 fixing were identified to be the most critical forms within the developing context.  
18 This study intends to contribute to a deepened understanding of corruption-  
19 related attributes in construction project management. It also offers valuable  
20 information to practitioners, particularly from the developing regions on the  
21 critical forms of corrupt practices within the different stages of the procurement  
22 process and the need to mitigate their incidence and widespread strategically  
23 based on informed decisions.

24 **Keywords:** Corruption; Infrastructure, Construction, Project Management,  
25 Developing Countries.

## 26 1 Introduction

27 Corruption in a project can be defined as the abuse of a project's resources for  
28 illegitimate personal gains [8;13]. And it remains one of the most critical issues not  
29 only in governments or at the national level but also at the institutional and project  
30 levels. It distorts the eternal triangle or aim of every construction project (i.e., cost,  
31 time, and quality). Corruption results in excessive spending, as opposed to the estimated  
32 allowable budget for a project, cause project delays and substandard execution of  
33 projects [14;16]. In other critical cases, corruption has been linked to the collapse of  
34 either ongoing or completed projects due to non-compliance to contractual  
35 specifications and standardized modus operandi of project planning and construction.  
36 A typical example is the collapse of the Rana Plaza commercial building in Bangladesh  
37 that recorded a death toll of more than 1,100 people with several others injured [1].

38 The first case of corruption recorded existed in the form of bribery [10]. Bribery  
39 has, therefore, been tagged as the form of corruption with long-standing recognition  
40 [6]. However, due to the evolution of corruption over the years, different forms of  
41 corrupt practices have emerged across diverse contexts [7]. For instance, in the context  
42 of procurement, some notable forms of corruption include bid suppression and rigging,  
43 solicitation, and extortion, among others [8].

44 All these practices and effects do not just happen in a vacuum. They are instigated  
45 by three primary theoretical constructs of corruption namely the causal factors of  
46 corruption [8;9], risk indicators, vulnerabilities or irregularities associated with project  
47 procurement and construction [16;13] and the barriers that hamper the efficacy of anti-  
48 corruption measures [4;11]. All these three theoretical constructs are still receiving a  
49 great deal of devoted attention by scholars even though new studies are yet to be  
50 conducted on the criticality of these constructs. Particularly on the specific stages of the  
51 construction process as well as how these factors can be thwarted. Moreover, despite  
52 the attention devoted to the explorations of the various constructs of corruption such as  
53 the causal factors of corruption and their corresponding risk indicators, the empirical  
54 assessment of the criticalities of the various corruption forms remains unexplored. The  
55 exploration of the forms of corrupt practices in infrastructure projects is needful for  
56 future endeavors such as the development of focused anti-corruption measures, provide  
57 a deepened understanding of the various forms of corrupt practices and facilitates the  
58 performance of in-depth research on the subject matter.

59 This study is, therefore, intended to deepen the understanding of the subject matter  
60 and provide valuable information to project participants, policymakers, anti-corruption  
61 activists and other key stakeholders involved in infrastructure projects on the criticality  
62 of the various corruption forms in projects and the need and efforts to extirpate them.

## 63 **2 Methodology**

### 64 **2.1 Research Design**

65 A questionnaire survey was conducted to solicit views from the experts concerning the  
66 forms of corrupt practices captured in this study. The underlying measurement items  
67 used to develop the questionnaire was adapted from the study of [6]. The items are  
68 identified to be the prevalent forms of corruption in the procurement of construction  
69 and other infrastructure-related works. While the study of [6] reported over twenty-  
70 eight prevalent forms of corrupt practices, this study made use of 27 forms discarding  
71 one of the forms known as '*guanxi*.' This form is noted to be a context-specific form  
72 common within the Chinese context. Thus, not entirely applicable to the Ghanaian  
73 context. The survey respondents were asked to rate the levels of criticalities of each of  
74 the 27 forms based on a five-point grading scale (1 = not critical and 5 = very critical).  
75 The use of questionnaires was adopted because they offer a valid and reliable source of  
76 information and is less costly [11]. Moreover, a questionnaire survey, to a large extent,  
77 warrants anonymity and the protection of respondents' data, especially on a sensitive  
78 topic of this nature [2].

## 79 2.2 Survey Participants

80 The respondents for this survey comprised of academics and practitioners involved  
 81 in the procurement and delivery of construction projects in Ghana. The criteria of  
 82 experts selection were limited to one's possession of a wealth of experience and  
 83 knowledge on the processes involved in the procurement and management of  
 84 construction works, and familiarity with the dynamics and stipulations or unethical  
 85 practices binding contractual and procurement works. A non-probabilistic sampling  
 86 technique known as purposive sampling approach was adopted for this study. The  
 87 snowballing technique is believed to also commence at some point since the  
 88 respondents were requested to invite their colleagues possessing similar skillset to  
 89 respond to the questionnaire.

90 Even though the topic of corruption may be considered as a general concern and  
 91 therefore the questionnaire could be answered by any person from the general public,  
 92 it often becomes difficult to explicate, especially when viewed under a specific context.  
 93 For instance, the subject of corruption observed in this study is captured under the  
 94 domain of construction procurement and management. Therefore, any potential  
 95 respondent should be able to understand the complexities involved in the procurement  
 96 process from the pre-contract stage to the post-contract stage and the construction  
 97 process which includes project design and execution, contract closeout, and dispute  
 98 resolution. This kind of knowledge is not common to the general masses even though  
 99 the subject of corruption remains a social issue and some may understand the concept  
 100 of corruption in the general setting but not in a defined context of expertise.

101 After the pilot study, expert survey, retrieval of the questionnaires and the  
 102 assessment of the initial data to address any discrepancy that may negatively affect the  
 103 data; 62 responses were regarded to be valid and suitable for further analysis. While  
 104 over 200 experts were invited, 91 responses were retrieved. And out of this number, 62  
 105 responses were regarded to be valid for further analysis. The survey was conducted  
 106 using practicing construction professionals, including civil engineers, quantity  
 107 surveyors, architects, contractors, and academics. Whereas the academics involved  
 108 were identified through their publications on the subject matter, the industrial experts  
 109 are senior managers of both private and public sector domains involved in the  
 110 procurement, execution and the management of construction and other infrastructure  
 111 works. The overall biodata of the respondents is presented in Table 1.

**Table 1: Respondents' data**

Construct	Sub-construct	Frequency	Relative Frequency	Cumulative Frequency
Sector	Public	20	32.26	32.26
	Private	30	48.39	80.65
	Both	12	19.35	100.00
	Total	62	100	
Professional background	Civil Engineer	17	27.42	27.42
	Quantity Surveyor	31	50.00	77.42
	Contractor	4	6.45	83.87

	Architect	7	11.29	95.16
	Academics	3	4.84	100.00
	Total	62	100	
Years of experience	Up to 10 years	45	72.58	72.58
	11-20 years	12	19.35	91.94
	21-40 years	5	8.06	100.00
	Total	62	100	

Source: Field data

### 112 3 Discussions

113 The categories developed in the study of [6] were maintained to ensure consistency. As  
 114 a result, the five main constructs, in addition to the unclassified construct, were  
 115 empirically assessed. They are; bribery acts, collusive acts, fraudulent acts,  
 116 discriminatory acts, and extortionary acts. However, only the top three constructs are  
 117 discussed due to word count or page limitation. Table 2 presents the descriptives of the  
 118 gathered data. It must be emphasized that the list was adapted from [6].

119 **Table 2: Descriptive of the variables (Criticalities of the Forms)**

No.	Variables	Mean	N-V	SIG	SD	OR	CR
1	Bribery	4.02	1.00	0.000	1.12	1	1
2	Lobbying	3.81	0.76	0.000	1.07	2	2
3	Facilitation payments	3.79	0.74	0.000	1.18	4	3
4	Kickbacks	3.74	0.68	0.000	1.24	7	4
5	Solicitation	3.66	0.59	0.000	1.28	9	5
6	Influence peddling	3.65	0.57	0.000	1.22	10	6
7	Front/shell companies	3.63	0.55	0.000	1.24	11	1
8	Collusion	3.58	0.49	0.000	1.03	14	2
9	Fraud	3.53	0.44	0.003	1.38	15	3
10	Ghosting	3.52	0.43	0.001	1.20	17	4
11	Dishonesty	3.44	0.33	0.007	1.24	18	5
12	Deception	3.37	0.25	0.020	1.22	20	6
13	Money laundering	3.27	0.14	0.129	1.41	23	7
14	Price fixing	3.81	0.76	0.000	0.99	3	1
15	Bid rigging	3.76	0.70	0.000	1.11	5	2
16	Cartels	3.26	0.13	0.08	1.14	24	3
17	Coercion	3.34	0.22	0.05	1.31	21	1
18	Blackmail	3.29	0.16	0.09	1.31	22	2
19	Extortion	3.24	0.10	0.13	1.22	25	3
20	Client abuse/clientelism	3.19	0.05	0.22	1.24	26	4
21	Intimidations and threats	3.15	0.00	0.33	1.16	27	5
22	Favoritism	3.68	0.61	0.00	1.17	8	1
23	Nepotism	3.58	0.49	0.00	1.18	13	2
24	Patronage	3.44	0.33	0.01	1.22	19	3

25	Conflict of interest	3.74	0.68	0.00	1.13	6	1
26	Embezzlement	3.61	0.53	0.00	1.08	12	2
27	Professional negligence	3.52	0.43	0.00	1.35	16	3

### 120 3.1 Bribery Acts

121 Albeit, bribery acts' construct was not anticipated to emerge as the most critical  
 122 construct especially when the entire construction and procurement activities and stages  
 123 are identified and reported to be plagued with collusive and fraudulent acts [15].  
 124 However, the bribery acts' construct was revealed to be the most critical construct  
 125 among all the forms of corrupt practices. It also emerged as one of the two constructs  
 126 with their entire variables identified or noted to be critical. However, unlike the results  
 127 ascertained regarding the most discussed construct of corruption forms, the bribery acts  
 128 construct was identified to be the third most discreet construct. Thus, while other  
 129 constructs are widely discussed as compared to the bribery construct, the bribery  
 130 construct was empirically identified to be the most critical in the context of the  
 131 developing countries such as Ghana [2]. From the descending order of criticalities, the  
 132 bribery variable was empirically assessed to be the most critical with a criticality index  
 133 of 4.02 followed by lobbying, facilitation payments, kickbacks, solicitation and  
 134 influence peddling with their criticality indexes at 3.81, 3.79, 3.74, 3.66 and 3.65 as  
 135 indicated in Table 2.

136 The realization of the bribery acts" construct was not all surprising as the construct  
 137 and its attributes are noted to be the most long-standing variants of all forms of  
 138 corruption [10]. Moreover, the form 'bribery' was assessed by the experts to be the most  
 139 critical form of corruption, not only under its construct but also among the entire  
 140 twenty-seven forms of corrupt practices. The promising and offering of rewards (most  
 141 typically, in monetary terms) to entice officials with delegated authority (example, the  
 142 tender adjudication panel member(s) or committee to illegally award a contract to the  
 143 supply-side (briber) of the corruption process is a common practice in the Ghanaian  
 144 public project processes [2]. And as indicated, this is expressed in the other forms such  
 145 as lobbying (distorting or negatively influencing, the policies of an institution to one's  
 146 favor), facilitation or grease payments and kickbacks [6]. However, inasmuch as these  
 147 forms have been indicated or identified to be the most critical in the developing context,  
 148 their generic criticalities may be argued out to be a common knowledge which does not  
 149 contribute that much toward the mitigation of their influence and negative impacts in  
 150 the modus operandi of the processes involved in a project. Thus, the needed attention  
 151 or the next line of focus towards the exploration of this construct and its variables can  
 152 examine their criticalities at the different stages of the project processes and the  
 153 mechanisms needed to limit the irregularities and the opportunities that create room for  
 154 any of these forms of corrupt practices. However, this recommendation does not only  
 155 apply to this construct (i.e., the bribery acts' construct) but all the other forms of corrupt  
 156 practices.

### 157 3.2 Collusive Acts

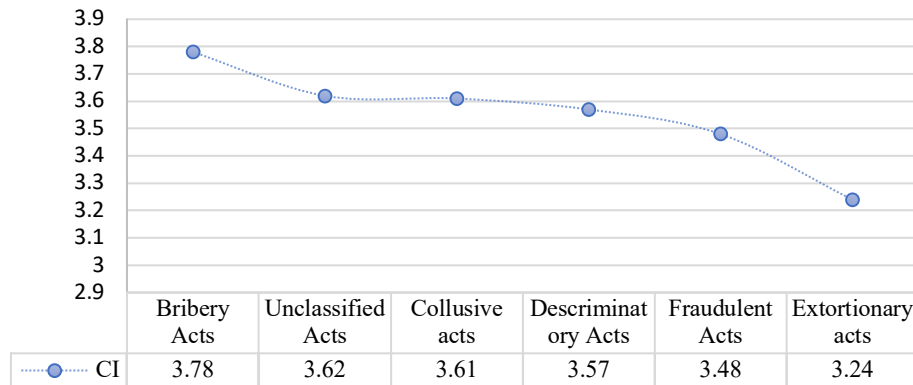
158 As indicated in [6], while the construct of collusive acts tends to be stand-alone, it is  
159 viewed by different scholars and reports as the most mentioned form of fraudulent acts.  
160 Thus, these two are correlated with each other as collusive practices fall under the  
161 construct of fraudulent practices. With an overall criticality index of 3.61, three main  
162 forms are captured under this construct, namely price-fixing, bid-rigging and the  
163 influence of cartels [5;6]. However, two out of the three forms were revealed to be  
164 critical, as assessed by the experts involved in the survey. They are 1) price-fixing, with  
165 a criticality index of 3.81 followed by bid-rigging with a criticality index of 3.76.  
166 Inasmuch as these variables or forms have been indicated by the experts to be critical,  
167 one will hardly find forms like price-fixing or cartels being reported in the news due to  
168 the subtle or clandestine nature as well as the ingrained endemic culture of corruption  
169 within the project-context of most developing countries such as Ghana [2]. Taking  
170 price-fixing as an example, unless one of the members of the cartel is willing to betray  
171 the rest of the team responsible for fixing prices, it is often difficult or challenging to  
172 discover such acts. It is, however, obvious that these forms of corrupt acts are often  
173 prevalent at the pre-contract stage of a project where tenders are advertised and solicited  
174 [12]. Thus, measures taken towards the extirpation of collusive practices as mentioned  
175 above may consider not only the generic connotations and incidences but also needful  
176 to strategically target the specific stage (with the respective activities) within which  
177 these forms occur. For instance, given that bid rigging occurs when consenting parties  
178 (from both the consulting and contracting teams) meet to settle on the bid results  
179 beforehand, how can this be stopped? Or what mechanism can be established to limit  
180 the opportunities that create room for corrupt practices of this nature to happen?  
181 Adopting transparency mechanisms have been suggested as one of the good approaches  
182 to limit such acts [8;16]. However, the adoption and modes of applications remain  
183 challenging, again due to the clandestine nature of corrupt practices [3;17].

### 184 3.3 Unclassified Acts (Professional Malfeasance Acts)

185 This construct contains stand-alone variables. Thus, as explicated at the literature  
186 review section, the construct was labeled unclassified because a common name was not  
187 developed. Three variables were captured under this construct, and they were all  
188 revealed to be critical in the developing context. According to the rating of the experts,  
189 the three variables captured under this construct together with their criticality indexes  
190 are 1) conflict of interest, noted as the most critical variable under this construct with a  
191 criticality index of 3.74) embezzlement with a criticality index of 3.61) professional  
192 negligence also with a criticality index of 3.52. Commencing from the most critical  
193 within this construct, the incidence of conflict of interest (defined as either any  
194 condition where a person or the organization within which they work is faced with  
195 choosing between the demands and duties associated with their work in contrast to their  
196 interests, within the public projects in the developing context is a common phenomenon  
197 [11;12].

198 The other forms captured under this construct namely embezzlement and  
 199 professional negligence share some common characteristics with conflict of interest in  
 200 that all the three classes of corrupt parties are not supposed to be present for these forms  
 201 of corruption to occur. In essence, one party (the corrupt party) is the key player in all  
 202 the three forms of corruption captured under this construct. For instance, unlike bribery,  
 203 collusive and discriminatory acts where there should be at least two consenting parties,  
 204 the forms under this construct epitomizes the misappropriation of power by just in an  
 205 individual with either absolute or delegated power. In the instance of embezzlement, a  
 206 single person holding an either an authoritative or a delegated power (i.e., either project  
 207 managers or employees) position illegally uses, misappropriates or traffics the  
 208 resources entrusted in his care but intended to complete the project for his interest [12].  
 209 Again, similar to the conflict of interest, the acts of embezzlement also distort or  
 210 compromises on the actual intended purpose of the projects' resources [12]. Same goes  
 211 for professional negligence where a careless act of a professional creates a vulnerable  
 212 room for the intended purpose of project resources to be misappropriated [6]. However,  
 213 unlike the first two variables where the actors or professionals involved are mostly  
 214 intentional about engaging in such acts, professional negligence can either be  
 215 intentional or unintentional. Thus, the development of effective measures to curb the  
 216 incidence and proliferation of these forms may consider not only the intended negative  
 217 acts from the professionals but also the proactive measures to curb or mitigate the  
 218 unexpected shortcomings of professionals that carry the potency of distorting any of  
 219 the processes involved in a project.

Criticality Index (CI) of Constructs



220  
221

Source: Field data

## 222 4 Conclusions

223 This study examined the criticality of the forms of corruption in the infrastructure  
 224 procurement process. Following a comprehensive review conducted by [6], this study  
 225 extended the previous knowledge by conducting an empirical examination of the forms  
 226 which was not conducted in the previous study. The empirical examination was

227 conducted using experts involved in the procurement and management of infrastructure  
 228 works in Ghana. The experts were sampled purposively (a non-probabilistic sampling)  
 229 because of the expertise needed to respond to the survey. A total of sixty-two responses  
 230 were noted to be valid and appropriate for further analysis. Per their assessment, the top  
 231 three critical constructs were bribery acts, professional malfeasance acts, and collusive  
 232 act. This study is intended to extend the current study on the forms of corruption and  
 233 offer valuable source of information to project parties and anti-corruption activists on  
 234 the criticalities of the identified forms in the context of developing regions. Future  
 235 studies can examine the criticality of each form at the various stages of the procurement  
 236 process as informed by big-data on actual cases. This study can, however, serve as a  
 237 source of reference to instigate more specific and focused works in other contexts. It is  
 238 also intended to deepen the understanding of the subject matter and provide valuable  
 239 information to project participants, policymakers, anti-corruption activists and other  
 240 key stakeholders involved in infrastructure projects on the criticality of the various  
 241 corruption forms of corruption in projects and the need and efforts to curb them.

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