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Corruption Forms in the Construction Industry: Literature Review

Albert P. C. Chan[1] and Emmanuel Kingsford Owusu[2]

Abstract: Over the past decade, corruption has elicited increasing attention in the construction industry, and several studies have been conducted and published on the topic of forms of corruption in the construction industry. However, a systematic review of the existing studies on corruption forms, which is essential for the future endeavor, is not available. This paper systematically reviews the existing body of knowledge about forms of corruption in the construction industry. Reviewing 39 selected peer-reviewed journal papers reveals 28 different forms of corruption. The most reported corruption forms in the literature are bribery, fraud, collusion, embezzlement, nepotism, and extortion. A conceptual framework is also developed for better understanding of the forms. The findings of this study contribute to deepened understanding of the forms of corruption in the construction industry, which would be useful for industry practitioners, policy makers, and anticorruption institutions to develop suitable anticorruption frameworks and strategies to effectively deal with corrupt practices in construction. The checklist and framework on corruption forms also make this paper useful for researchers to conduct further empirical studies on the topic.
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Introduction

Owing to the high incidence of corruption in the construction industry, several studies have identified various forms of corruption in the industry (Dorée 2004; Brown and Loosemore 2015; Bowen et al. 2012; Le et al. 2014; Olawale and Sun 2013; TI 2016). The construction industry has been identified as the most corrupt sector, and the procurement sector is also branded to be the most vulnerable sector to the incidence of corrupt activities (TI 2005; Krishnan 2010). A report issued by the Organization for Economic Co-operation and Development (OECD) (2014) revealed that corruption had been deemed as one of the primary barriers to sustainable socioeconomic and political development in developed, developing, and emerging economies alike. In all, corruption increases inequality, reduces efficiency, and is estimated to account for over $2.6 trillion annually, which is approximated to be 5% of the global gross domestic product (GDP) with over $1 trillion expended in bribes annually. Bribery has been revealed to be the most mentioned form of corruption in the industry as it is discussed later in this study. Most recognized anticorruption frameworks are designed to deal with bribery cases. One typical example recently developed is the ISO 37001 antibribery management systems by the International Organization for Standardization (ISO) (2016). Noonan (1984) opined that the first case of corruption ever recorded was in the form of bribery, which occurred around 3000 BC. Bribery has therefore been regarded as the primary form of corruption that exists to date. However, because of the evolution of corruption over the years different forms of corrupt practices have emerged, and more money is being expended in these newly generated forms.

The continual research on corruption over the last two decades has revealed varying forms of corruption in the studies available, but there is no literature to date that presents a comprehensive review of the forms of corruption prevalent in the context of the construction, engineering, and the procurement sectors. Therefore, this study aims to fill the gap by presenting a comprehensive review of the various forms of corruption present in the mentioned sectors. The objectives are to identify the forms available and present a conceptual framework for easy identification of the identified forms. Grasping an in-depth understanding of the various forms of corruption is very crucial to the development of anticorruption measures (Bowen et al. 2012; Søreide 2002; Tanzi 1998; Le et al. 2014; Shan et al. 2016). Therefore, this study will provide vital information to industry practitioners, policy makers, and anticorruption institutions in various ways such as the formulation of anticorruption measures and easy detection or identification of a corrupt practice. To the academic and industry researchers, this study will provide them the basis of delving into deeper research works with regards to forms of corruption. With the identification of new forms of corruption, innovative frameworks can be formulated in a more specific manner to tackle corruption from all angles, thereby leading to the reduction of these practices in the short term and hopefully eradicating their existence in the long-term run. The aim and the objectives of this study are discussed the subsequent sections.

Anatomy of Corruption

While the adverse implications of corruption are conspicuous, the term itself does not lend itself to a single definition. The term originates from the Latin word corruptio, meaning "a moral decay, rottenness, putridity or wicked behavior" (Johnston 1996). Different researchers have defined corruption in different contexts,

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and the forms of corruption identified in the literature vary from sector to sector, although similar forms can be identified across varying cultures, sectors, and organizations. One of the most cited definitions of corruption was given by Nye (1967). Nye (1967) defined corruption as any act that diverges from the acceptable norms of the society often with the motives of status benefits or monetary gains. Other definitions have been developed by other anticorruption institutions and researchers, but with regards to the construction industry. Le et al. (2014) concisely define corruption as the abuse of assigned authority at the expense of a construction project. According to Boyd and Padilla (2009), corruption consists of three components, namely the demand side or the party that requests corruption; the supply side or the party that offers it; and lastly the condoning side, the party aware of what is happening but who remains silent or is not bothered by it.

Corrupt practices identified in the construction industry can be attributed to causative factors such as inadequate sanctions, poor documentation of records, insufficient transparency in the selection criteria for bidders, poor professional ethical standards, great project complexity, etc. (Tanzi 1998; Bologna and Nord 2010; Dorée 2004; Sohail and Cavill 2008; Le et al. 2014). This has led to the evolvement of different forms of corrupt practices in the construction sector. The first form of corruption identified in literature was bribery, which according to Noonan (1984), was discovered in 3000 BC. Currently, several forms of corruption exist not only in the construction industry but also other sectors, including banking and education. While forms of corruption such bid-rigging are more associated with the construction industry and the procurement sector, other forms of corruption such as plagiarism, unauthorized tutoring, and research misconduct are associated with the educational sector (Osipian 2007). The impact of corruption on the industry and the public at large is not difficult to find: shorter lifespan of buildings, collapse of buildings, and the claiming of human lives (Lewis 2003; Hui 2009; Ambraseys 2010). Anticorruption measures developed to check corruption in the construction industry come in the form of ethical code, whistle-blowing mechanism, comprehensive rules and regulations, harsh punishment, or penalties such as sanctions and criminal conviction (fines and/or imprisonment), among other measures (Krishnan 2009; Tabish and Jha 2011b, 2012; Le et al. 2014; Brown and Loosemore 2015; Zhang et al. 2016). These measures, together with others, are developed with the aim of annihilating the issue of corruption in the construction industry.

A thorough understanding of the varying forms of corruption and the degree of corruption on a broader scale can enable anticorruption institutions to develop pragmatic measures needed to curb corruption. Given the rather broad classifications of the corruption forms (CFs) identified in the literature over the years and also the absence of any review study devoted to corruption forms, this paper set out to review studies on corruption forms in the construction industry with the aim of providing comprehensive framework for easy identification of the forms. Because it is expedient to know the exact medication to prescribe for the treatment of a disease, dealing with corrupt practices from the standpoint of the noted forms, i.e., knowing their exact root causes, can be an effective position to start from in dealing with corruption in the construction industry. The checklist of the CFs provided could be useful for researchers for further research and anticorruption institutions or industry practitioners to formulate comprehensive anticorruption measures to tackle CFs that are widespread in the construction and procurement sectors. The paper also provides a conceptual framework for the classification of CFs based on their definitions and the literature reviewed.

Methodology

Tsai and Wen (2005) and Yi and Wang (2013) asserted that to properly review and analyze a relevant matter in academia, it is expedient that the researcher performs a thorough and systematic examination of previous works. Therefore, in conducting this review, the methods adopted by Osei-Kyei and Chan (2015), Le et al. (2014), and Olanipekun et al. (2017) were employed to guide the selection of papers relevant for this review study. Explicitly, this study adopted a two-way approach of arriving at the final papers. Unlike the normal terrain of performing a desktop search at Stage 1 using powerful search engines such as Google Scholar, Scopus, Web of Science, or PubMed and later on narrowing down into the targeted journal, which is commonly restricted to Chau's (1997) and sometimes journals with more than two or three papers explicating the subject matter (Osei-Kyei and Chan 2015), this study rather consulted the targeted journals first, also adopting similar approach, (i.e., Chau's (1997) ranking at the first stage and at the second stage), performed the desktop search with the help of Google Scholar (Olanipekun et al. 2017; Xiong et al. 2015), and also employed the 'journals with more than two or three papers' technique for the journal identification and selection. The two stages are therefore explicated subsequently.

Phase 1: Target Journal Search

As mentioned, Stage 1 comprised of retrieving relevant papers from targeted journals, which was conducted using Chau's (1997) rankings. Again, unlike the studies mentioned that normally consider the leading six journals in Chau's (1997) ranking, this study increased the number of journals to be considered for the review to the leading 12, i.e., journals with their average score more than 60% according to the percentage scores given to rank the journals. The journals identified included: *Construction Management and Economics* (CME), *International Journal of Project Management* (IJPM), *Engineering Construction and Architectural Management* (ECAM), *Journal of Construction Engineering and Management* (JCEM), *Journal of Management in Engineering* (JME), *Proceedings of the Institution of Civil Engineers–Civil Engineering* (PICE–CE), *International Journal of Construction Information Technology* (CIT), *Transactions of American Association of Cost Engineers* (AAC), *Automation in Construction* (AIC), *Journal of Construction Procurement* (JCP), *Cost Engineering* (CEN), and *Building Research and Information* (BRI). All these journals have their respective virtual libraries (VLs). Therefore, to commence the search, the VL, which includes the ASCE Library, Taylor and Francis Online, Science Direct, Institution of Civil Engineers Virtual Library, and Emerald were consulted directly to access the journal's papers initial needed. After identifying the journals in their respective VL, the search engines for each journal in the VLs were correspondingly located. *Corruption* was made the common keyword in the various search engines of the virtual libraries. Even though the data or relevant papers required or to be considered for the review were to be restricted to *forms of corruption* in the construction industry, the theme of corruption was employed to widen the number of search publications. At the end of the initial search, the relevant retrieved publications included: JCEM (90), CME (107), ECAM (33), IJPM (62), JME (60), PICE–CE (26), and AIC (2). The following journals had no paper on corruption, so they were excluded: CIT, AAC, JCP, and CEN. At the end of the initial search, another examination involving a thorough and more rigorous visual examination that included in-depth reading were conducted to sieve the papers in order to identify papers relevant for this review. Thus, papers that

Table 1. Search Results of Relevant Publications with Selected Journals

Number	Name of journal	Number of initial searches	Number of final searches
1	*Building Research and Information* (BRI)	20	1
2	*Journal of Construction Engineering and Management* (JCEM)	90	7
3	*Construction Management and Economics* (CME)	107	7
4	*Engineering, Construction and Architectural Management* (ECAM)	33	8
5	*International Journal of Project Management.* (IJPM)	62	6
6	*Journal of Management in Engineering* (JME)	60	4
7	*Leadership and Management in Engineering* (LME)	40	4
8	*Proceedings of the Institution of Civil Engineers–Civil Engineering* (PICE-CE)	26	1
9	Specially selected papers (based on subject matter and number of citations)	1	1
10	*Automation in Construction* (AIC)	2	0
	Total	441	39

were more aligned to or dealt with the subject matter forms of corruption in construction were regarded as valid. At the end of the examination, the following papers were included for the review: JCEM (7), CME (7), ECAM (8), IJPM (6), JME (4), PICE-CE (1), BRI (1), and AIC (0). These were considered as the final papers for Stage 1 and they total 34.

Phase 2: Secondary Desktop Search

In Stage 2, the authors realized that other recent potential journals that were not captured by Chau's ranking were not included although the initial papers retrieved from the Chau's (1997) journals were exhaustive enough for the review, so the authors adopted Xiong et al. (2015) and Olanipekun et al. (2017) approach to identify the potential journals that have published on the subject matter. This was conducted to retrieve the second batch of papers using Google Scholar. In selecting the journals, the following parameters were set: (1) as mentioned earlier, journals that had more than two (three or more) publications explicating the subject matter were to be considered (Osei-Kyei and Chan 2015); (2) journals that were already identified in Chau's (1997) were to be discarded because Google Scholar also identified papers from these journals; and (3) only papers that dealt either partially or fully with the subject matter forms of corruption in the construction industry were deemed to be valid. At the end of this search, the *Journal of Leadership and Management in Engineering* was the lone journal considered because it was the only journal with 40 initial papers and 4 final papers (more than two papers) that dealt with the issue under consideration. The 40 journals publications also underwent a thorough visual scrutiny to cut down to the final four. Finally, other notable forms of corruption identified by Transparency International (TI 2016) were added to the data set as distinct publications for three reasons: (1) its worldwide recognition as an anticorruption institution; (2) its investigation of countries and sectors in order to identify prevailing forms of corruption; and (3) the forms are identified in the construction industry. In total, 39 papers were retrieved at the end of the search for review and analysis. All the 39 publications with their respective findings are presented in Table 1, and their references are provided in the Appendix. All the searches were undertaken in August 2016. Content analysis as a qualitative research technique was adopted to analyze the findings of the review.

Results and Discussion

The summary of the entire publications retrieved and the identified corruption forms are presented in Table 2. The subsequent subheadings provide results on the annual trend of CFs publications, the origin or source of the publications, the contributing authors to the identification of CFs, the findings of CFs identified in the literature, a conceptual framework of CFs for the construction industry, and brief descriptions of the various CFs under the categorized constructs.

Yearly Trend Publications on Corruption Forms

Fig. 1 represents the yearly trend of CFs publications in construction. As noted by Tanzi (1998) and Zou (2006), corruption is not a new problematic phenomenon but has lived with humanity since early ages. Therefore, it is unsurprising that an appreciable number of recent publications reveal different forms of corruption in the construction industry. For instance, bribery and fraud were the noticeable forms of corruption in the early days (Noonan 1984; Klitgaard 1988); however, current literature depicts the emergence, evolution, and revelation of other forms of corruption such as dishonesty, professional negligence, solicitation, and clientelism, which were not mentioned in the literature of early times. It stands to reason that the continual devotion of research into corruption in the construction industry has the capacity of revealing different forms of corruption in the construction industry. For example, the first mention of professional negligence as a form of corruption in the studies reviewed was in 2007 by Bowen et al. (2007) and Ho (2013). The identification of this form of corruption can enable anticorruption institutions or researchers to develop a measure to curtail it. Also, client abuse, which is also referred as clientelism by Transparency International (2016), was only identified in the publication of Zhang et al. (2016) as a form of corruption. This means that even if a comprehensive anticorruption framework had been developed in the previous years, it could not have made a provision for client abuse because it was recently discovered as a form of corruption. The identification of these new forms of corruption should make it possible for institutions to take notice of them and to put in place pragmatic anticorruption frameworks to curtail them before they assume gargantuan magnitudes like bribery and fraud. As shown in Fig. 1, research publication on forms of corruption increased in 2009, dropped in 2010, and regained momentum in 2011 and 2012, in which the highest number of publication on corruption forms in the construction industry was recorded. Before 2009, there were not many publications on corruption forms, although this situation may not necessarily apply to other sectors/fields. However, since 2009 the yearly publication trend on corruption forms has been quite impressive. That said, there is no gainsaying that more research still needs to be carried out to identify other hidden forms of corrupt practices, especially because practices are most often secretive in nature, very sensitive, and difficult to expose. The subsequent sections present the findings from the identified publications on the analysis of corruption forms, the conceptual framework of corruption forms and the directions for future studies.

Table 2. Corruption Forms Identified in the Literature

	Publication																																						
Form	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	Total
Bribery	—	x	x		x	—	x	x	x		x	—	x		x	x		x	—	—	x	x	x	x		x	x	x	x	—	—	x	x	x	x	x	x	x	x	27
Fraud (Falsification)	—	x	—	x	—	—	x	—	—	x	x	—	x	x	x	x		x	—	—	—	—	x	x	—	—	—	—	—	x	—	x	x	x	x	x	x	—	x	20
Collusion	x	x	—	x	—	—	—	—	—	—	x	—	x	x	x	x	x	x	x	—	—	—	x	x	—	—	—	—	—	—	—	x	x	x	x	—	x	—	x	19
Embezzlement	—	—	—	—	—	—	x	x	—	—	x	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	x	x	x	—	—	x	—	x	9
Nepotism	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	x	—	—	—	—	—	—	x	—	—	—	—	—	x	x	—	—	—	—	—	—	x	7
Extortion	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	x	—	—	x	—	—	—	—	—	—	—	x	—	x	—	x	—	—	x	7
Conflict of interest	—	—	—	x	—	—	—	—	—	—	x	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	x	—	—	—	x	—	x	7
Big rigging	x	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	x	—	—	—	—	—	x	—	—	—	—	—	—	—	x	x	—	—	—	x	—	—	7
Kickbacks	—	—	—	—	—	—	x	—	—	x		—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	x	x	—	—	6
Professional negligence	—	—	—	x	—	—	—	—	—	—	x	—	x	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	5
Front/shell companies	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	x	—	x	5
Favoritism/cronyism	—	—	—	—	x	—	—	—	—	—	—	x		—	—	x	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
Dishonesty	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	x	—	—	x	—	—	—	—	4
Facilitation payments	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	x	3
Price fixing	—	—	—	—	—	—	—	—	—	—	x	—	—	x	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Guanxi	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	x	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	3
Patronage	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	3
Client abuse/clientelism	—	—	—	—	—		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	x	2
Ghosting	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Influence peddling	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	2
Money laundering	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	x	2
Lobbying	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	1
Intimidations and threats	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Coercion	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Cartels	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	1
Blackmail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	1
Solicitation	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	1
Deception	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—	—	—	—	1

Note: References are found in the Appendix.

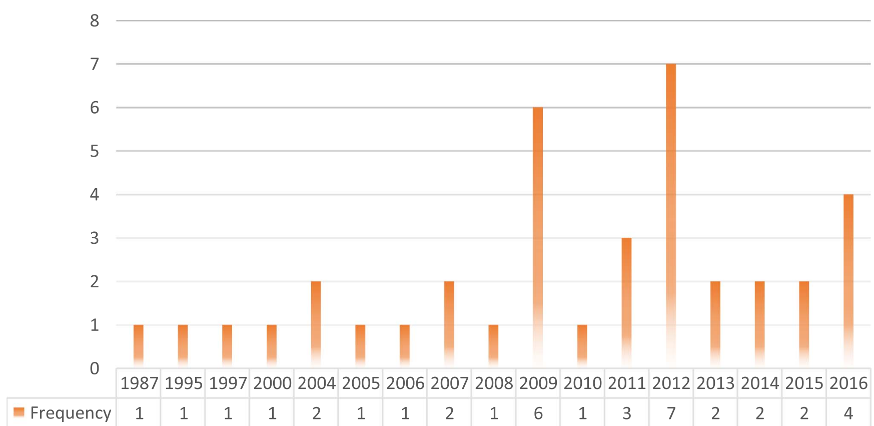

Fig. 1. Annual trend of CF publications

Findings from Studies on the Analysis of Corruption Forms

An appreciable number of publications have identified and explicated different forms of corrupt activities that take place in the construction sector, although comparatively small regarding total identified publications retrieved for this review. An unstructured review of different publications was also conducted randomly to find out if there were other forms of corruption peculiar to construction that were not identified in the selected publications for this review. It was discovered that all the identified forms in Table 2 constituted the forms identified in other publications, thereby justifying the suitability of the selected papers for this review. Conversely, forms of corruption that did not have a direct correlation with the construction industry were discovered; for example, the identification of plagiarism in the education sector. This notwithstanding, and based on the comparative study of the identified forms in Table 2 and the randomly selected publications, the forms of corruption in construction identified in this study are considered comprehensive because they captured all the forms of corruption captured in the random papers.

At the end of this review, 39 publications were identified to explicate the forms that do occur as corrupt practices in the construction industry. Also, from these 39 publications, a total

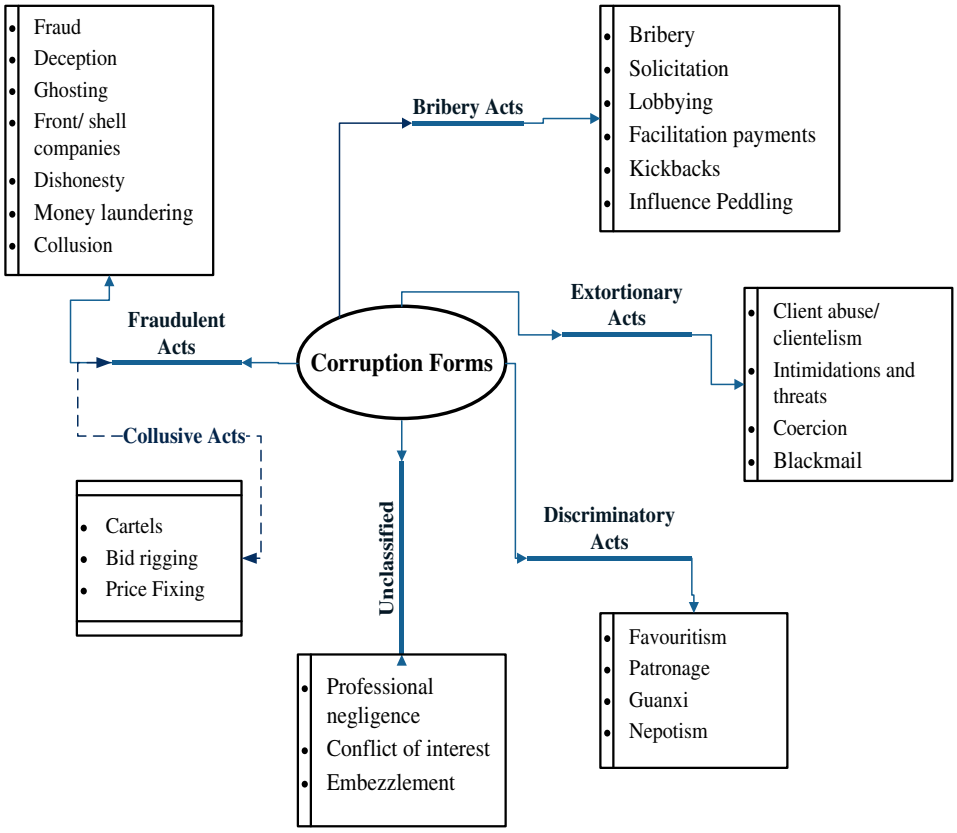

Fig. 2. Conceptual framework for CFs classification

of 28 different forms of corruption in the construction industry were captured. As presented in Table 2, the numbers 1–39 represent the papers retrieved for the review and the markings with the symbol (x) represent the frequency of an identified form among the publications. For example, publication number 8 is a paper authored by Tsai, J. S., and Chi, C. S. In this paper, the authors captured two forms of corrupt practices; similarly, bribery as a form of corruption was identified by 27 different publications as shown in Table 2. Also from Table 2, it is shown that the evolution of corruption over the years has led to the emergence of many other forms in the industry. The most identified CFs in the selected papers included bribery, collusion, fraud, collusion, embezzlement, nepotism, and extortion. All the forms are briefly described to provide some information to stakeholders and industry practitioners. After the identification of the CFs, it was realized that some of the forms were identical based on the definitions and classifications done in other studies. A conceptual framework of CFs categories was then developed with the aim of providing easy identification of CFs and clear direction in the application of anticorruption measures (ACM).

Classification of Corruption Forms

As presented in Table 2, the review conducted revealed the prevalence of several forms of corruption that exist in the construction industry. However, to better understand these forms, it is expedient to categorize them into constructs to set out the differences that exist among them. The classification was done purely on two premises: (1) the relationship and the commonalities that exist among the variables (by definition), and (2) from previous studies that classified some of the variables. For instance, Powpaka (2002) classified kickbacks as a form of bribery act in his studies. Similar classifications by other studies were followed to develop the framework as presented in Fig. 2. The discussion section reveals other examples of the classification.

Fig. 2 presents a conceptual framework of the classification of CFs into identical constructs based on their definitions. The categorization was also constructed with the aim of grouping identical factors with the assumption that an anticorruption measure developed for a variable within a construct can go a long way to check other variables within the same construct. For instance, an ACM developed to check favoritism can be adopted to mitigate the existence of cronyism, nepotism, patronage, and guanxi to some extent, although it will be expedient to provide specific measures to these respective forms. At the end of the categorization, the primary constructs identified were bribery acts, fraudulent acts, collusive acts, discriminatory acts, extortionary acts, and unclassified acts. Some CFs could not be grouped under any construct because the categorization was purely constructed based on their definitions from the selected publications. Therefore, they were placed under the "Unclassified Acts" section. These forms include professional negligence, conflict of interest, and embezzlement.

Corruption Forms Constructs

The constructs are bribery acts, fraudulent acts, collusive acts, extortionary acts, discriminatory acts, and unclassified acts. Bribery acts like other constructs was framed based on the commonalities of the variables with regards to their definition and also based on the classifications of other previous works. Because of word and space limitations, all the forms are briefly discussed within their primary constructs.

Bribery Acts

Based on the relationships that exist among the variables within the construct, bribery acts consists of bribery, kickbacks, facilitation payments, influence peddling, lobbying, and solicitation. These are briefly discussed as follows.

Bribery refers to a corrupt act that may involve giving, promising, soliciting, accepting, or offering a benefit to lure or entice someone to act in an unethical or illegal manner. Enticements can be in the form of rewards, fees, loans, gifts, or any supplementary advantage such as donations, special treatment, or services. Any act of this form in the construction industry or procurement is deemed bribery (Le et al. 2014; Meduri and Annamalai 2013; Wang et al. 2000; Loosemore and Lim 2016; Zhi 1995). As mentioned by Noonan (1984), bribery acts constitute the first ever corruption case. Although there has been countless mention and identification of this form in the industry, according to this review, the first mention of a bribery case was recorded in construction projects was by Stuckenbruck and Zomorrodian (1987). Bribery was identified by 27 out of 39 different publications constituting over 70% of the entire publications reviewed. Therefore, this ranks bribery as the topmost recorded form of corruption in the industry. The next mentioned bribery act is a *kickback*. Per the study of Sohail and Cavill 2008; Adams 1997; Brown and Loosemore 2015, kickback may refer to an illegal act where a secret payment is demanded by an individual in a coercive position from another party in search of an advantageous or a biased decision. Kickbacks, per Powpaka (2002), are effectively described as bribes, although it can also be regarded as extortion. Kickbacks were identified by 6 out of 39 publications. Solicitation is the act of enticing, ordering, influencing, or asking another party to indulge in the act of bribery or other corrupt behaviors (TI 2016). A typical example of this form is shown in the thematic responses by the respondents involved in a study by Bowen et al. (2012). However, the form is not mentioned in their study. *Facilitation payments* are regarded as small bribes that can also be termed as grease or speed payments normally made to speed up or secure an action to which the briber already has authorized or other rights to (Liu et al. 2004; Kenny 2012; TI 2016). This form of corruption is not new to the industry. However, only three studies identified facilitation payments as a CF in the industry. *Lobbying* refers to any corrupt act that is undertaken to influence the decisions and policies of an institution to favor an outcome or a course. These acts may turn out to be very misleading if there are inconsistencies in the existence of different stages of influence by individuals, organizations, associations, or different institutions (TI 2016). *Influence peddling* is described as the use of one's status or influence on behalf of another person for a special advantage in return for financial favors or other benefits. For instance, during a contract award stage of a project, if a senior procurement officer manipulates the process by using his power to unfairly influence the decision to favor a contractor in return for a percentage of the contract sum, the act is termed as influence peddling and the official involved is known as the peddler. The actor is often regarded as an influence peddler (Bowen et al. 2012; Stansbury 2009).

Fraudulent Acts

Fraudulent acts in the construction industry consist of fraud, collusion, front/shell companies, dishonesty, ghosting, money laundering, and deception. However, under collusive acts that are classified as fraudulent acts, the variables consist of bid rigging, price fixing, and cartels. These are briefly described as follows.

Fraud simply refers to the act of deception with the intention to cheat. This takes place when a party deceives another person with the aim of gaining an illegal or unfair advantage (contract award, financial, political). Some countries consider this offence as a felonious act or violating civil laws (Le et al. 2014; Meduri and Annamalai 2013; Wang et al. 2000; Tsai and Chi 2009) *Ghosting* refers to an entity (either an individual or a unit) made-up for the purposes of fraudulent act or deception (Bowen et al. 2012; Brown and Loosemore 2015). *Front/shell companies* refer limited liability companies or corporations that have no corporal existence regarding jurisdiction, no commercial activities, nor are they made up of any real employees. They are normally established within secrecy or tax haven jurisdiction with the primary purpose of shielding the actual beneficial proprietor from either disclosures or taxes or both (Bowen et al. 2012; Brown and Loosemore 2015; TI 2016). *Dishonesty* can be described as an act of lying, stealing, or cheating with the primary aim of acquiring, converting, or disposing of either tangible or intangible property to obtain an upper hand or a benefit. It can be defined as fraud in criminal law and can include either pretense or act deceitfully to obtain a benefit. *Deception* refers to the act of presenting wrongful information with the aim of misleading another person concerning a situation that in itself is true (Stansbury 2009). *Collusion* is regarded as an undisclosed arrangement that exists among the parties involved, either in the private or public sector or both, who meet to conspire to commit deceitful or fraudulent acts with the intention of gaining illegitimate rewards such as financial gains. The participants who normally engage in collusive acts are known as *cartels* (Dorée 2004; Shan et al. 2016). *Money laundering* refers to the act of concealing the ownership, source, or the end point of money obtained in an unlawful of a dishonest manner and secretly placing it in legitimate ventures or projects to make them look lawful (Stansbury 2009; TI 2016).

Collusive Acts

Under the collusive acts construct, the factors identified were cartels, bid rigging, and price fixing. A *cartel*, also regarded as a form of collusive act and similar to bid rigging, transpires when two or more firms arrange or enter into an agreement to limit the flow of materials or fix the prices of goods they control in a specific industry (Stansbury 2009). *Bid rigging* refers to a collusive act where consenting participants settle on the results of a bid process beforehand. For instance, in some cases, a bidder specifies a very limited time for the preparation of tender documents with the sole aim of controlling the number of prospective bidders. Therefore, only those who were given prior notice of the upcoming bid stand the chance of submitting adequate tender documents (Dorée 2004; Bowen et al. 2012; Brown and Loosemore 2015; Sichombo et al. 2009). *Price fixing* is a collusive act analogous to big rigging. With this act, a sect of competitors or tenderers colludes to either manipulate or fix prices rather than observe an open market competition (Tabish and Jha 2011a).

Discriminatory Acts

Discriminatory acts simply depict the actions of showing more concern or favors that are ethically and professionally wrong. They include nepotism, favoritism, patronage, and guanxi.

Favoritism refers to the act of offering special treatment to either an individual or a group of persons, and it often takes the form of awarding a contract, honoring, hiring, benefits, among others, even though the person may not necessarily be qualified for the position or the contract offered. It is regarded as a comprehensive term because it manifests itself in the form of cronyism, nepotism, and/or patronage (Wang et al. 2000; Ling and Tran 2012; Wibowo and Wilhelm 2014). *Nepotism* refers to act where an individual in a

position grants a favor to either a relative or a friend without suitable regard to qualification (Willar et al. 2016; Corvellec and Macheridis 2010). *Patronage* is regarded as a form of favoritism where an individual is offered a job, award contract, or other benefits regardless their entitlement or qualifications and it is normally due to either the individual's connections or affiliations (Waara and Bröchner 2006; Brown and Loosemore 2015; TI 2016). *Guanxi* is a Chinese term for nepotism although not all guanxi may be termed unlawful. In some cases, it turns to favor the parties that have good connections in a local domain, but it becomes unlawful when the favor is granted to a party or group of persons not deserving the favor (Weisheng et al. 2013; Ke et al. 2011; Xu et al. 2005).

Extortionary Acts

Extortionary acts are forceful acts that induce fear in the victim with the aim of making the victim act against his will or to benefit the oppressor, who is mostly of a higher status. They include extortion, client abuse/clientelism, intimidations and threats, coercion, and blackmail. Brief descriptions are given as follows.

Extortion refers to the direct or indirect act of using one's power, knowledge, or status to coercively threaten others in the form of demanding unmerited benefits, compensations, or benefits (Tabish and Jha 2012; Liu et al. 2004; Sichombo et al. 2009; TI 2016). *Intimidations and threats* are regarded as a form of extortion where an individual intentionally induces a sense of subjection, inferiority, or fear into another person or group of persons with the aim of frightening them to make them do what the intimidator wants. *Blackmail* can be described as a condition or act when a party threatens another party if the latter party does not render some privileges or advantages demanded by the former party and the threats are usually in the form of punishment or a mean act as observed in the act of coercion. This was revealed by Smith (2009), but it is rarely mentioned in the industry. Coercion is regarded as a direct or indirect act of committing harm, prejudice, or threats to negatively influence the actions of another person often to favor the coercer (Sichombo et al. 2009). *Client abuse/clientelism* refers to a biased arrangement of exchanging goods, favors, or resources on a manipulative affiliation between a powerful party and a punier client (Zhang et al. 2016; TI 2016).

Unclassified Acts

This construct is named unclassified because no literature classified them. Although there is a commonality among the three variables of a negative professional attitude, no literature has classified them and hence they are left unclassified. They include embezzlement, conflict of interest, and professional negligence and are briefly discussed as follows.

Embezzlement refers to an act where an individual misappropriates, traffics, or uses either goods or funds of an organization or an institution entrusted in their care for personal benefits. For example, when a contractor diverts construction materials allocated for an execution of a project, the contractor is said to have embezzled the client's goods because the client is most often the financier of the project (Sohail and Cavill 2008; Tsai and Chi 2009; Bowen et al. 2012). *Conflict of interest* in the construction industry refers to the situation where a professional of the industry is challenged with a choice of deciding between the demands and duties required by profession and their respective personal interests (Ho 2013; Bowen et al. 2012). *Professional negligence* was insinuated as a corrupt conduct in the construction industry that occurs when a professional fails to provide a responsibility of care that a normal careful and prudent professional would offer given the same conditions. For example, some recorded negligence acts include poor supervision, deficit in material quality, or insufficient requirements regarding safety (Ho 2011, 2013).

The overall frequency and ranks of CFs construct with their associated variables are presented in Table 3 and graphically presented in Fig. 3. The ranking system was achieved based on the individual frequencies identified in the papers and using a mathematical calculation to determine the mean scores of each construct. The total frequency of the forms within a construct was added together and divided by the number of the forms n. The construct with the highest mean was ranked first and follows in that order. For instance, bribery acts (BA) was calculated as follows:

$$\sum(\mathrm{BA1}+\mathrm{BA2}+\mathrm{BA3}+\cdots+\mathrm{BA6})/n$$
$$=\sum(27+6+3+2+1+1)/6=6.60$$

Therefore, *BA* was placed third because it comes after fraudulent acts first and unclassified acts second.

Discussion

Studies have gone a long way in identifying some of the causative measures as well as the risk factors that instigate these CFs in the industry. For instance, bribery acts such as facilitation payments, lobbying, and solicitation were identified not only as a result of economic setbacks such as low level of employers (Le et al. 2014; Tanzi 1998; Boyd and Padilla 2009), or the delay in the payment of workers' salaries (Alutu 2007), which may need mediums such as corruption to enable them survive, but also the absence of effective and responsible administrative systems. This can be a major contributory factor to the occurrence of bribery acts in the construction industry (Stuckenbruck and Zomorrodian 1987). Fraudulent practices have not only become the order of the day in the construction industry today, but also the most identified CFs with the very high tendency of occurrence in the industry (Meduri and Annamalai 2013; Tsai and Chi 2009).

Mizoguchi and Quyen (2014) attributed the pervasiveness of fraudulent or collusive practices such as of big rigging in the tendering process to how opaque the whole process can become. The authors revealed that contracts consist of a seller and a purchaser, and during tendering process each of them may have several means of corrupting the process at any given stage. Before awarding the contract to the bidder, any high-profile member of the tender adjudication panel can modify project information to favor certain bidders or suppliers, reveal the confidentiality of other bidders, or manipulate the process to debar potential bidders (Stansbury and Stansbury 2008; Sohail and Cavill 2008; Zou 2006). These acts symbolize clear indications of fraudulent and bribery acts, and they constitute the top two CFs in the industry (Table 3). However, just as these top two have been identified to happen actively at the tendering stage, which is just one example of the entire construction project process, a thorough study needs to be conducted on the various construction stages and in projects with regards to different contracts in order to practically know the extent of occurrence of each particular CF in any activity carried out in the industry. Deng et al. (2003) reported that the most costly and serious CFs may occur after awarding the contract, during the execution stage. With an agreement among colluding parties, the enforcement of quality standards and contact's performance standards may be compromised. This may constitute a collusive act. Simply put, there may be a high incidence of collusive practices at the project execution stage. All these findings may need to be investigated further

Table 3. Corruption Form Constructs' Rank

Number	Construct	Forms	Code	Frequency	Mean	Rank
1.0	Bribery acts	—	BA	—	6.60	3
1.1		Bribery	BA1	27	—	1
1.2		Kickbacks	BA2	6	—	6
1.3		Facilitation Payments	BA3	3	—	9
1.4		Influence Peddling	BA4	2	—	10
1.5		Lobbying	BA5	1	—	11
1.6		Solicitation	BA6	1	—	11
2.0	Fraudulent acts	—	FA	—	7.57	1
2.1		Fraud	FA1	20	—	2
2.2		Collusion	FA2	19	—	3
2.3		Front/Shell companies	FA3	5	—	7
2.4		Dishonesty	FA4	4	—	8
2.5		Ghosting	FA5	2	—	10
2.6		Money Laundering	FA6	2	—	10
2.6		Deception	FA7	1	—	11
2.2.0	Collusive acts	—	CA1	—	3.67	6
2.2.1		Bid rigging	CA2	7	—	5
2.2.2		Price fixing	CA3	3	—	9
2.2.3		Cartels	CA4	1	—	11
3.0	Extortionary acts	—	EA	—	2.40	5
3.1		Extortion	EA1	7	—	5
3.2		Client abuse/clientelism	EA2	2	—	10
3.3		Intimidations and threats	EA3	1	—	11
3.4		Coercion	EA4	1	—	11
3.5		Blackmail	EA5	1	—	11
4.0	Discriminatory acts	—	DA	—	4.25	4
4.1		Nepotism	DA1	7	—	5
4.2		Favouritism	DA2	4	—	8
4.3		Patronage	DA3	3	—	9
4.4		Guanxi	DA4	3	—	9
5.0	Unclassified acts	—	UA	—	7.00	2
5.1		Embezzlement	UA1	9	—	4
5.2		Conflict of interest	UA2	7	—	5
5.3		Professional negligence	UA3	5	—	7

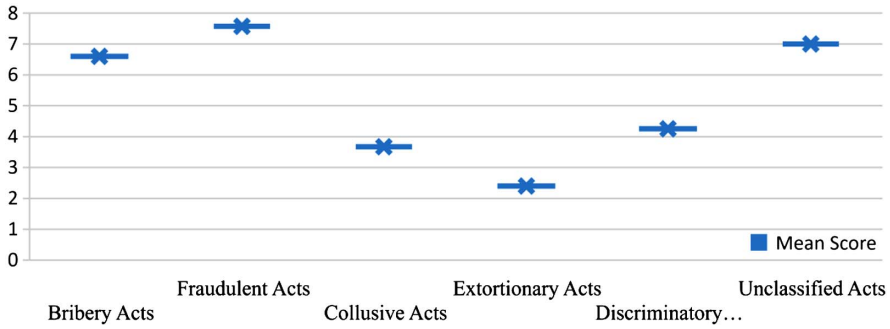

Fig. 3. Graphical presentation of the constructs mean score

at different project levels to practically determine which form is highly predominant at different levels.

Anytime discriminatory acts are mentioned, the relationship is not missing. One primary source of any form of a discriminatory act is cultivated from a relationship, whether a distant or close relationship. Ling and Tran (2012) and Yow and Zonggui (2004) identified over-close relationships as one of the primary causative factors that breed nepotism, favoritism, patronage, and guanxi. This act is highly evident in China where even the term guanxi is known everywhere in the public sector (Zhang et al. 2016; Le et al. 2014). There are several causative risk factors and also several proactive measures, such as the development of ethical codes (Ho 2013; Hartley 2009), ensuring a rigorous technical auditing system, and rigorous project supervision (Brown and Loosemore 2015; Tashjian 2009; Zou 2006), and reactive measures, such as promoting fair debarment procedures, debarring culprits from undertaking any future contracts (Sohail and Cavill 2008; De Jong et al. 2009; Bowen et al. 2007), or giving severe punishment or penalties such as sanctions or criminal conviction (fines and/or imprisonment) (Stansbury 2009; Krishnan 2009). All these measures among many others have been developed to tackle the various forms of corruption that exist in the industry today. The list could go on and on. However, this section may not exhaust every single cause or driver nor the measures needed to thwart the occurrence of these forms that exist today in the industry. However, this study postulates that deeper empirical research needs to be conducted on every single form in the various geographical regions across the globe.

Directions for Future Research

The dynamic criticality of CFs in the industry is thought to vary under in various construction projects and stages, as well as the types of contracts used. For instance, it is believed that certain types of contracts used in the industry such as the unit price contracts, cost plus, lump sum contracts, and contractual bonds such as bid bonds, performance, or maintenance bonds may either have a direct or indirect relationship with the identified CFs (Deng et al. 2003). However, per the publications identified and selected for this review, there is no general consensus or empirical underpinning that strongly affirms the previously stipulated notion. Therefore, there is a need for further studies to critically investigate the mappings of the identified CFs to the various stages of a construction and engineering projects, the different classes of projects, and the various contract types adopted for the projects. One example might be mapping out the relationship between the pervasiveness of CFs in the industry and the various construction contracts used. An investigation into this may inform building clients on the suitable type of contract to adopt that will decrease the chance of corrupt practices. Investigations into the contracts can also be extended to the different types of contracts involved in procurement concessions, such as the effect of design-build-operate contacts of the various forms of corruption. This may as well reveal the vulnerabilities of the various types of concessions to corruption, and the pragmatic solutions that can be drawn to curtail the incidences. All these and much more are untouched areas when the topic of CFs in the construction industry is raised. Hence a more thorough and empirical research is needed to address these gaps.

Also, pragmatic measures have been taken to address bribery as a pervasive CF to an extent; for instance, the International Organization for Standardization has recently implemented the ISO 37001, known as the antibribery management systems to help deal with the incidences of bribery (ISO 2016), and the measures stipulated in ISO 37001 manual may apply to the construction industry as well. Other several efforts have been taken to empirically analyze the general issue of corruption (de Jong et al. 2009). However, a deeper and a more thorough and rigorous empirical research could be conducted to investigate the causal measures and their impact, the vulnerabilities and corruption indicators, strategic and anticorruption measures, and frameworks directed to every single form of corruption in the construction industry.

Lastly, comparative research may also be conducted empirically to identify whether or not the risk factors or causes instigating a form of corruption, say solicitation, are similar in terms of geographical scopes, the various construction phases, or even the processes or stages involved in construction procurement. These are all new research areas in construction management (CM) research on corruption that have not been tackled yet, and because CM research on corruption seems to have gained momentum explicating general matters, a more direct and focused attention can be skewed toward these specific issues to help minimize the incidence of corruption in the construction industry. It is in the identification of the causal measures, risk factors, and other corruption form instigators that innovative and comprehensive strategic measures and frameworks can be developed to mitigate the incidence of corruption in the construction industry.

Limitation

This is a review study with no empirical results or justifications, hence the results cannot be generalized on the broader spectrum and context of corruption forms in terms of geographic regions. However, thorough empirical surveys could be carried out in respective geographical regions or across different construction phases to determine the highly-ranked forms that need immediate attention.

Conclusion

Grasping an in-depth knowledge about the CFs and the key sources of corruption constitutes one of the pivotal drivers in corruption research. It enables anticorruption institutions, policy, and decision makers on corruption to develop and focus anticorruption measures that tackle specific forms of corruption. The fight against corruption can never be done if the exact forms to be eradicated are not known. Because of this, an appreciable body of literature has been devoted to the identification of corruption forms in the construction industry. Governments and other institutions have also placed critical emphasis on the identification and elimination of these forms from public sectors and procurement sectors. However, because no study has been conducted to review all the forms that exist in the industry, the authors identified this gap and decided to fill it by conducting a comprehensive review of the selected publications devoted to the identification of CFs that have existed within the industry over the years. The two primary issues that were addressed by this study were the identification of the various CFs and the development of a framework for easy identification and classification under their various constructs.

From 39 selected publications, 28 different CFs were identified. The review revealed that the most notable forms of corrupt practices in the construction industry included bribery, fraud, collusion, embezzlement, and nepotism. Other forms of corruption identified, which might be new to some industry practitioners, include ghosting, lobbying, influence peddling, intimidations and threats, coercion, cartels, blackmail, solicitation, money laundering, and deception although these forms may not be new in other sectors. These forms may need further research to determine the extent to which they are gaining grounds in the construction industry. With respect to the year with most recorded publications on the forms of corruption, 2012 recorded the highest number followed by 2009 and 2016.

The provided checklist may serve as a guide for industry practitioners, anticorruption institutions, and decision makers to develop more specific and comprehensive anticorruption measures with the aim of helping to reduce the incidence of corruption in the short-term and terminating its existence in the long-term. Lastly, a conceptual framework of CFs categories was developed and intended to inform industry practitioners that anticorruption measures developed for one unique construct can help mitigate the variables within the construct. For instance, an ACM directed to tackle extortionary acts could be used to check the variables within the extortion construct, which include coercion, client abuse, blackmail, intimidations, and threats. The categorized constructs in the framework comprise bribery acts, fraudulent acts, collusive acts, extortionary acts, discriminatory acts, and the unclassified. From the papers reviewed, there exist more forms of corruption currently than there were some decades ago. Therefore, there is a need for the development and application of more specific and innovative strategic anticorruption frameworks to reduce the high incidence of corruption in the construction sector.

Data Availability Statement

Data generated or analyzed during the study are available from the corresponding author by request. Information about the *Journal*'s data sharing policy can be found here: http://ascelibrary.org/doi/10.1061/%28ASCE%29CO.1943-7862.0001263.

Appendix. Selected Papers on Corruption Forms

Number	Journal	Year	Authors	Citations
1	BRI	2004	Dorée, A. G.	107
2	JCEM	2014	Le, Y., Shan, M., Chan, A. P., and Hu, Y.	13
3	JCEM	2012	Meduri, S. S., and Annamalai, T. R.	14
4	JCEM	2013	Ho, C. M.	10
5	JCEM	2000	Wang, S. Q., Tiong, R. L., Ting, S. K., and Ashley, D.	147
6	JCEM	2006	Waara, F., and Bröchner, J.	94
7	JCEM	2008	Sohail, M., and Cavill, S.	57
8	JCEM	2009	Tsai, J. S., and Chi, C. S.	36
9	CME	2011a	Tabish, S. Z. S., and Jha, K. N.	25
10	CME	1997	Adams, O.	71
11	CME	2012	Bowen, P. A., Edwards, P. J., and Cattell, K.	23
12	CME	2012	Ling, F. Y. Y., and Tran, P. Q.	19
13	CME	2007	Bowen, P., Akintoye, A., Pearl, R., and Edwards, P. J.	54
14	CME	2011b	Tabish, S. Z. S., and Jha, K. N.	37
15	CME	2012	Tabish, S. Z. S., and Jha, K. N.	12
16	ECAM	2016	Loosemore, M., and Lim, B. T. H.	—
17	ECAM	2016	Willar, D., Trigunarsyah, B., and Coffey, V.	1
18	ECAM	2015	Brown, J., and Loosemore, M.	2
19	ECAM	2014	Wibowo, A., and Wilhelm Alfen, H.	6
20	ECAM	2013	Weisheng, L., MM Liu, A., Hongdi, W., and Zhongbing, W.	14
21	ECAM	2004	Liu, A. M., Fellows, R., and Ng, J.	38
22	ECAM	2011	Ke, Y., Wang, S., Chan, A. P., and Cheung, E.	38
23	ECAM	2007	Man-Fong Ho, C.	24
24	IJPM	2009	Sichombo, B., Muya, M., Shakantu, W., and Kaliba, C.	21
25	IJPM	2010	Corvellec, H., and Macheridis, N.	21
26	IJPM	2013	Hwang, B. G., Zhao, X., and Gay, M. J. S.	67
27	IJPM	2015	Zeng, S. X., Ma, H. Y., Lin, H., Zeng, R. C., and Tam, V.	7
28	IJPM	1995	Zhi, H.	333
29	IJPM	1987	Stuckenbruck, L. C., and Zomorrodian, A.	33
30	JME	2013	Olawale, Y., and Sun, M.	11
31	JME	2005	Xu, T., Smith, N. J., and Bower, D. A.	32
32	JME	2014	Le, Y., Shan, M., Chan, A. P., and Hu, Y.	10
33	JME	2016	Zhang, B., Le, Y., Xia, B., and Skitmore, M.	—
34	LME	2009	Stansbury, C.	3
35	LME	2009	Hartley, R.	6
36	LME	2009	Smith, J. H.	2
37	LME	2009	de Jong, M., Henry, W. P., and Stansbury, N.	20
38	PICE-CE	2012	Kenny, C.	2
39	SP*	2016	Transparency International	—

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