

# Overview of Corruption Research in Construction

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DOI: 10.1061/(ASCE)ME.1943-5479.0000300

## Introduction

Corruption exists in both developed and developing countries of various political and economic systems, and its occurrence is highly associated with economic growth and development stages (Ehrlich and Lui 1999). As a result of continued economic growth and rapid urbanization worldwide (World Bank 2010), a great amount of investments have yielded in infrastructure and urban construction projects, thus triggering an increase in corruption risks when managing these projects around the world. An increasing number of academic publications have witnessed this trend in the construction engineering and management (CEM) field over the past decade (Sonuga et al. 2002; Zou 2006; Sohail and Cavill 2008; Tabish and Jha 2011a; Bowen et al. 2012). Compared with earlier studies' focus on legislative and administrative systems at the macro level (Johnston 1986; Doig 1995; Tanzi 1998; Ehrlich and Lui 1999; Treisman 2000), the research focus of these studies undertaken by CEM researchers is on corruption prevention issues at the medium and micro levels.

As a core industrial sector, the construction industry plays a vital role in national economies and constantly contributes to improvements in the built environments of human societies. However, these positive social images have been increasingly diminished by corruption issues in recent years (Transparency International 2008).

Corruption can ruin the industry at multiple levels and lead to underperformance of construction projects, such as quality defects and cost overruns (Kenny 2009). This issue also has a negative impact on the healthy development of the global construction industry (Goldie-Scot 2008). In the past decade, corruption in the construction industry has attracted wide attention, not only from researchers in developed countries such as the United States (Sohail and Cavill 2008; Crist 2009), the United Kingdom (Amaee 2011), and Australia (Hartley 2009), but also from those in developing countries such as India (Tabish and Jha 2011a, b, 2012), Nigeria (Alutu 2007; Alutu and Udhawuve 2009), Pakistan (Choudhry and Iqbal 2013), and South Africa (Bowen et al. 2007a, b, 2012). Ample evidence indicates that corruption in construction has become a significant global challenge faced by all of these countries. To provide a thorough view of corruption research in construction, this paper will conduct a systematic review of corruption-related papers in peer-reviewed CEM journals. Two specific questions will be addressed in this paper:

1. To what extent are corruption topics covered in peer-reviewed CEM journals from 1990 to 2012?
2. What are the future directions for research on corruption in construction?

## Corruption in Construction

Corruption is regarded as a major obstacle to economic and social development (World Bank 1997). In the construction industry, corruption may occur in any phase of a project; namely, project initiation, planning and design, bidding and construction, and operation and maintenance (Tabish and Jha 2011a). Recent investigations by Transparency International (2002, 2006, 2008, 2011) revealed that the construction industry has become the most corrupt industry owing to the rapid growth of the worldwide construction market after entering the 21st century. This is primarily attributable to the fragmented nature of the construction industry (involving clients, designers, contractors, consultants, and suppliers), which imposes difficulties in tracing payment information (Ahmad et al. 1995; Kenny 2009). Sohail and Cavill (2008) estimated that the annual loss from corruption in the global construction market reaches approximately US\$340 billion, which accounts for 10% of the global construction market value (approximately US\$3.2 trillion).

Some efforts have been made to investigate causes of corruption in the construction industry. In some cases, corruption is regarded as the result of an unethical decision (Zarkada-Fraser and Skitmore 2000; Liu et al. 2004; Moodley et al. 2008). For developing countries in societal transition that may lack mature law systems, corruption may be worsened by insufficient legal punishments and penalties (Bologna and Del Nord 2000). Bowen et al. (2012) regarded the lack of positive role models of public officials as a key cause of corruption in construction. Tabish and Jha (2011a) emphasized that corruption in construction is attributable to the lack of standardized execution in construction projects. Sohail and Cavill (2008) summarized several primary causes of corruption in construction: (1) overcompetition in the tendering process, (2) insufficient transparency in the selection criteria for tenderers, (3) inappropriate political interference in cost decisions,

(4) complexity of institutional roles and functions, and (5) asymmetric information amongst project parties.

To prevent corruption caused by these factors, several industrial associations, nongovernmental organizations (NGOs), and international organizations have made great efforts and provided several guidelines on this factor. ASCE promoted a “zero tolerance” policy to cultivate an anticorruption culture in the U.S. construction industry (Crist 2009). In collaboration with the Global Infrastructure Anti-Corruption Centre (GIACC), Transparency International developed an integrated anticorruption system: the Project Anti-Corruption System (PACS). The PACS proposes a group of anticorruption strategies to prevent corruption, such as the appointment of an independent assessor, commitment of all participants, disclosure of project information, and the use of anticorruption agreements (Transparency International 2013). The World Economic Forum also established the global Partnering against Corruption Initiative that provides a platform to companies for preventing corrupt practices (World Economic Forum 2013). Despite considerable efforts, the construction industry seems still to be facing an increasingly serious challenge in various countries of the world, especially in developing countries (Goldie-Scot 2008).

## Research Methodology

This paper adopted the structured review method advocated by Ke et al. (2009) to identify corruption-related papers published from 1990 to 2012.

First, a list of peer-reviewed CEM journals was formulated as the source for identifying related papers, according to the CEM journal ranking list by Chau (1997). Selected journals included the top six journals in the ranking list of Chau: *Construction Management and Economics* (CME), *Journal of Construction Engineering and Management* (JCEM), *Engineering, Construction and Architectural Management* (ECAM), *Journal of Management in Engineering* (JME), *Proceedings of the Institution of Civil Engineers: Civil Engineering* (PICE-CE), and *International Journal of Project Management* (IJPM). A full search of related papers in each of the six journals was conducted by using databases with a full collection of reports from 1990 to 2012. The common keyword “corruption” was used in the title/abstract/keyword field for the search engines of databases such as the ASCE Library, Taylor and Francis Online, SciVerse ScienceDirect, Emerald, and Institution of Civil Engineers Virtual Library. The search results by frequency were as follows: CME (68), JCEM (67), ECAM (10), JME (27), PICE-CE (17), and IJPM (38). These identified papers were reviewed to examine their relevance to the topic. Only those studies that focus on corruption in construction are regarded as valid. Thus, the results were refined and trimmed down as follows: CME (11), JCEM (5), ECAM (2), JME (3), PICE-CE (2), and IJPM (2).

Second, a separate research was conducted to identify more papers on corruption in the construction industry by using the Web of Science (WoS), the Compendex and Engineering Index Backfile (CEIB) on Engineering Village, and the ASCE Library. The keywords of “corruption” and “construction” were both used in the subject/title/abstract field of search engines in the three databases; the initial search results were 95 in the WoS, 282 in the CEIB, and 52 in the ASCE Library. After reviewing research topics of these papers, only 31 papers were identified as valid, which include 18 in the WoS, 3 in the CEIB, and 10 in the ASCE Library. Finally, a total of 56 papers were identified as corruption-related papers and used in this review work. All literature searches were conducted in September 2012.

## Current Research Interests

Three primary areas have been identified to categorize the research interests of the 56 papers, including forms of corruption in construction, impacts of corruption in construction, and anticorruption strategies.

### Forms of Corruption in Construction

Twelve forms of corruption in the construction industry were identified as follows: bribery, fraud, collusion, bid rigging, embezzlement, kickback, conflict of interest, dishonesty and unfair conduct, extortion, negligence, front companies, and nepotism.

Bribery is the most common and serious form of corruption in the construction industry, particularly in developing countries (Barco 1994; Vee and Skitmore 2003; Alutu 2007; Bowen et al. 2007a, b, 2012; Goldie-Scot 2008; Sohail and Cavill 2008; Sichombo et al. 2009; Krishnan 2009; Stansbury 2009; Hartley 2009; Jong et al. 2009; Ameh and Odusami 2010; Ke et al. 2011; Meduri and Annamalai 2013; Tabish and Jha 2012). This misconduct refers to “offering, giving, receiving or soliciting of anything of value to influence the action of an official in the procurement or selection process or in contract execution” (Hartley 2009). Based on an empirical survey in South Africa, Bowen et al. (2007a, b) examined the process of bribery and found that it could take various forms, such as gifts, cash, overseas and holiday trips, special favors/privileges, and affirmative appointments.

Fraud is another common form of corruption in construction. This misconduct primarily takes the forms of misinformation (e.g., alteration of documents and deliberate intention to mislead and withhold information), deceit (e.g., making invoices and payment for materials without being received), and theft (e.g., materials and equipment) (Vee and Skitmore 2003; Heuvel 2005; Bowen et al. 2007a, b, 2012; Sohail and Cavill 2008; Jong et al. 2009; Tabish and Jha 2011a). According to the two questionnaire surveys conducted in Australia and South Africa (Vee and Skitmore 2003; Bowen et al. 2007a, b), deceit and misinformation are regarded as the most common forms of fraud.

Collusion is a form of corruption in which a secret agreement is reached between two or more parties for a fraudulent or deceitful purpose (Besfamille 2004; Heuvel 2005; Brockmann 2009; Sichombo et al. 2009; Jong et al. 2009; Tabish and Jha 2011a; Chotibhongs and Arditi 2012a, b). Collusion can benefit the involved parties by sacrificing the normal benefits of the project or the public (Dorée 2004; Graafland 2004; Bowen et al. 2007a, b). Zarkada-Fraser and Skitmore (2000) stated that most collusive practices are conducted by tenderers during project biddings to win contracts. Zarkada-Fraser (2000) emphasized that collusion seriously corrodes the foundation of the competitive principle in the construction industry.

Bid rigging is a major form of corruption that usually occurs between a tenderer and a tenderer (Vee and Skitmore 2003; Sichombo et al. 2009; Krishnan 2009; Hartley 2009; Jong et al. 2009; Bowen et al. 2012). In this case, a tenderer may intentionally set up some constraints (e.g., a short time limit and inappropriate qualification requests) in bidding documents to help its favored tenderer attend the tendering and win the contract (Jong et al. 2009). Bowen et al. (2007a, b) further identified several common forms of bid rigging, such as cover pricing, bid cutting, hidden fees and commissions, and compensation for tendering costs of unsuccessful tenderers.

Embezzlement is a crime in which a person fraudulently misuses the power or resources in their position to intentionally procure personal, illegal benefits (Green 1993; Hartley 2009;

Jong et al. 2009; Stansbury 2009). In the construction industry, a typical example of embezzlement is the misappropriation of project funds (Tow and Loosemore 2009; Ling and Hoang 2010). Embezzlement can seriously affect the cost management of construction projects (Sohail and Cavill 2008). For example, payment for a contractor can be defaulted by the client's embezzlement of the project funds, which may delay project delivery or even result in project failure.

Kickback refers to illegal economic incentives that a person uses to seek a favorable decision from a person in power (Barco 1994; Sohail and Cavill 2008; Jong et al. 2009; Bowen et al. 2012). For instance, a client's staff may receive an economic reward from a tenderer by helping them win the contract. A recent questionnaire survey in Nigeria revealed that the contractor that wins a contract usually includes a kickback into the price quotation for bidding (Alutu 2007).

Conflict of interest refers to a situation in which a professional in a position of trust, such as a site supervisor, an auditor, or a cost consultant cannot impartially fulfill their duty because of ambivalent professional or personal interests (Bowen et al. 2007a, b; Hartley 2009; Jong et al. 2009). Despite the lack of improper activity evidence, a conflict of interest can cause an appearance of impropriety and thus undermine confidence in the professional opinions or actions, which may negatively affect the performances of projects (Bowen et al. 2007a, b).

Dishonesty and unfair conduct mostly occur in the bidding, contract negotiation and signing, and project construction phases (Vee and Skitmore 2003; Alutu 2007). Bowen et al. (2007a, b) analyzed primary opinions on dishonesty and unfair conduct from key stakeholders in construction projects: (1) architects believe that contractors are not always honest when following contractual specifications, and that they commonly use cheap and inferior alternatives; (2) contractors believe that the tendering adjudication process is unfair, and that there exist a bias in professionals' acts when clients greatly intervene in the process; and (3) quantity surveyors believe that contractors always repeatedly overclaim in the project construction phase.

Extortion refers to corrupt conduct motivated by personal desire for extra income, which usually take the form of forcing extraction of bribes and asking for favors from vulnerable project parties (Sohail and Cavill 2006; Sichombo et al. 2009; Stansbury 2009; Tabish and Jha 2011a; Bowen et al. 2012). Extortion usually occurs from a party to another party involved in a project, such as (1) from client staff to contractors or material suppliers, (2) from a major contractor to their subcontractor, (3) from a potential subcontractor to a material/equipment supplier, and (4) from regulatory/permitting agencies to clients, contractors, or material/equipment suppliers. Extortion can result in the misuse of project funds and provide some individuals with illegal incomes (Jong et al. 2009).

Negligence is a common form of corruption in construction projects that is characterized by failure to exercise the due care of a responsible professional (Richard 1972). Specific forms of negligence include inadequate quality specifications, poor workmanship, insufficient safety specifications, low-quality materials, poor process supervision, and lack of project management and skills (Vee and Skitmore 2003). Bowen et al. (2007a, b) observed that more than 90% of architects and cost consultants have committed negligence in the South African construction industry.

Front companies refer to corporate entities that are established by persons who hold senior positions in the government or client organizations to obtain illegal benefits in awarding construction contracts (Jong et al. 2009). Although these companies are not familiar to the public, they can secure construction contracts because of the power of their owners and delegate them to other contractors

or suppliers at a lower price (Hartley 2009). The price difference exactly represents illegal income for these corruptors.

Nepotism refers to corrupt conduct by which a person may provide assistance to a tenderer who has some kinds of relational links, such as common race, same origins, or good friendship (Kadembo 2008; Hartley 2009; Bowen et al. 2012; Ling and Tran 2012). Nepotism, which is also called the "good old boys' network" (Singh and Shoura 1999), can have multiple negative impacts on performances of construction projects, such as low construction productivity and low managerial efficiency (Kale and Arditi 1998).

### **Impacts of Corruption in Construction**

The 56 identified papers revealed three primary impacts of corruption on various levels of the construction industry; namely, corruption risks in construction projects (micro), impacts on the expansion strategies of global companies (moderate), and social and economic impacts (macro).

Corruption is an extremely significant risk that greatly impacts core management tasks in construction projects, particularly in developing countries lacking mature legislative and administrative system (Ofori 2000; Choudhry and Iqbal 2013; Deng et al. 2013; Fernandez-Dengo et al. 2013). Wang et al. (1999, 2000) identified corruption as a major risk in managing build-operate-transfer (BOT) projects and found that bribing governmental officials is a major corruption risk in Chinese BOT projects. Numerous researchers stated that public-private partnership projects in China and Turkey also face a high risk in corruption prevention (Xu et al. 2010; Chan et al. 2011; Ke et al. 2011; Gurgun and Touran 2013). Meduri and Annamalai (2013) added that corruption risks can lead to an increase in project costs and a waste of public funds in India because of extra bribe expenditure.

Corruption can also affect the execution of expansion strategies of global companies in the international construction market (Ling and Hoang 2010). Crosthwaite (1998) stated that, despite the great construction demand and enormous latent profits in some developing countries, the level of corruption in a country may be a key consideration for global companies to decide whether to enter the market in the country. Tang et al. (2012) also stated that corruption combined with political and physical factors is critical for an overseas company to successfully enter the Chinese construction market. However, Barco (1994) pointed out that bribery is commonly used as a strategy by global companies to gain competitive advantages in winning overseas construction contracts.

Corruption can hinder the social and economic development of human societies worldwide (Snaith and Khan 2008). Empirical studies have revealed that corruption causes economic problems and worsens current economic crises in some European countries. For instance, Jimenez (2009) noted that corruption in the construction industry led to the speculative bubble in Spain. Romero et al. (2012) stated that corruption has resulted in many unsuccessful urban expansion cases in Spain. Skorupka (2008) and Badun (2011) reported that the slow development of infrastructure in Poland and Croatia is attributable to corrupt practices. Developing countries in Asia and Africa face more severe situations. For instance, many global contractors abandoned water and irrigation projects in Nigeria (Sonuga et al. 2002) and road projects in Afghanistan (Unruh and Shalaby 2012) because of serious corruption in these two countries.

### **Anticorruption Strategies**

The third stretch of existing corruption research centers on anticorruption strategies in the construction industry. This primarily



involves four major strategies: transparency mechanism, ethical code, project governance, and audit and information technology.

Transparency mechanism is an important strategy for corruption prevention in construction projects (Deng et al. 2003). Sohail and Cavill (2008) observed that transparency mechanisms can provide the public with access to information on construction projects so that project performance can be monitored and decision makers can be held accountable for their decisions. Kenny (2012) further indicated that the regular exposure of contract and implementation details is a common method for improving project transparency. Goldie-Scot (2008) noted that some developing countries such as Tanzania, Zambia, the Philippines, and Vietnam have already made considerable efforts in introducing transparency initiatives to prevent corruption in construction projects.

Ethical code is another important proactive strategy that is commonly used to prevent corrupt practices (Fan et al. 2001). For instance, a National Code of Practice for the Construction Industry has been promoted in Australia to discipline all industry professionals (Hartley 2009). Sohail and Cavill (2008) noted that ethical training programs can help prevent corruption and that developing an ethical code for a particular stakeholder may be more useful because the universal industry ethical code cannot include exhaustive guidelines for all situations that different stakeholders face in their work. Goldie-Scot (2008) added that to construct a positive industry atmosphere, ethical behavior should be rewarded.

Several project governance strategies can also contribute to prevent corruption in construction. Kenny (2009) argued that the separation of project ownership and regulatory functions of the government in construction projects can effectively mitigate corruption because it can restore the competitive nature of the construction sector. Bowen et al. (2012) stated that good leadership can facilitate corruption prevention, thereby contributing to project success. Tabish and Jha (2012) stressed that harsh punishment should also be considered in the design of anticorruption strategies because it can increase the fear of professionals and reduce their potential corrupt practices.

Audit and information technology play an increasingly important role in corruption prevention in the construction industry worldwide (Zou 2006; Wu et al. 2014). Sichombo et al. (2009) stated that technical auditing in the project precontract phase can minimize or prevent corrupt practices in construction projects. Sohail and Cavill (2008) suggested that the integrity pact and information technologies widely applied worldwide can also help prevent corruption. The European Union (EU) has promoted a debarment system, which records companies and individuals found guilty of corruption and helps to prevent these corrupt companies and individuals from participating in EU projects (Jong et al. 2009).

Several international organizations and industrial associations have made substantial efforts to promote the mixed use of two or three of the preceding strategies for preventing corruption in the construction industry. For instance, Transparency International published a special report on corruption in construction in 2005 and consequently developed PACS in 2007 to assist project participants in preventing corruption (Krishnan 2009). Similarly, the International Federation of Consulting Engineers developed some corruption prevention information systems for its members, such as the Business Integrity Management System and the Government Procurement Integrity Management System (Boyd and Padilla 2009). The GIACC established the GIACC Resource Centre and provided industrial professionals the free access to advice and tools on corruption identification and prevention. ASCE has established a Committee of Global Principles for Professional Conduct and an Engineer's Charter in the organization, which has developed related policies, such as *Statement 510 Combating Corruption*,

and reviewed anticorruption issues in annual meetings (Crist 2009). In the U.K., the Anti-Corruption Forum that involves the Institution of Civil Engineers, the Chartered Institute of Building, the Royal Institution of Chartered Surveyors, and the Association of Consulting Engineers and other local institutions, has been held annually since 2003 and many useful guidelines have been provided on corruption prevention in the construction industry (Goldie-Scot 2008).

## Future Research Directions

### ***Identification of Corruption in Construction in Developing Countries***

The identification of corrupt practices is essential to address corruption issues in the construction industry, particularly in those developing countries facing a greater challenge in preventing corruption owing to the lack of sufficient legislative and institutional support (Ofori 2000). However, this area has just recently received growing research concern from researchers in a few developing countries, such as South Africa, Nigeria, Pakistan, and India (Alutu 2007; Bowen et al. 2007a, b, 2012; Alutu and Udhawuwe 2009; Ameh and Odusami 2010; Tabish and Jha 2011a; Choudhry and Iqbal 2013). With the recognition that a small ratio of developing countries (four in 199) have been engaged in this area (United Nations Development Program 2010), existing research is still limited and may be not fully address related issues. Thus, greater research efforts, particularly from researchers in those developing countries where related research has not been conducted, should be directed to this area.

### ***Evaluation of Corruption in Construction***

Evaluating corruption is crucial for achieving anticorruption progress for greater integrity, higher transparency, and better accountability performance (Goel and Nelson 2011; Foster et al. 2012). Sampford et al. (2006) and Zou (2006) also emphasized that only by understanding the extent of corruption can effective anticorruption strategies be formulated and implemented. However, a review of the 56 related papers indicates that previous studies seldom provide systematic approaches for the evaluation of corruption in the construction sector, representing a great opportunity for future research.

### ***Examination of the Effectiveness of Anticorruption Strategies***

Although several anticorruption strategies have already been proposed and employed in the construction industries of various countries, the effectiveness of these strategies has seldom been systematically examined. Additionally, the severe situation of corruption in construction has not been alleviated by far, because the construction is still the most corrupt industry recognized by the public (Transparency International 2002, 2006, 2008, 2011). Thus, there is an urgent need to conduct in-depth examinations of the effectiveness of anticorruption strategies that are being implemented. By doing this, better development and execution of anticorruption strategies can be attained for a more transparent, healthy, and sustainable industry.

## Conclusions

This paper has undertaken a critical review of 56 corruption-related papers published in the period of 1990–2012. The majority

of these papers were identified either from six peer-reviewed CEM journals (i.e., CME, JCEM, ECAM, JME, PICE-CE, and IJPM) or from three primary research databases commonly used in the CEM field, including the WoS, the CEIB, and the ASCE Library. Research interests of these papers were categorized under three primary areas: forms of corruption in construction, impacts of corruption in construction, and anticorruption strategies. A review of these papers has revealed primary developments and different perspectives of corruption research in construction, representing the state of the art on this topic.

Three areas for future research were also proposed in this paper, including the identification of corruption in construction in developing countries, the evaluation of corruption in construction, and the examination of the effectiveness of anticorruption strategies. Considering that corruption is a common challenge to construction industries in both developed and developing countries, and has just started to receive attention from academics, this topic deserves more research input that will eventually help to establish a body of knowledge on corruption in construction and facilitate better development of anticorruption strategies.

## Acknowledgments

The work described in this paper has been funded by the National Natural Science Foundation of China (Grant No. 71172107 & 71390523) and the Joint Ph.D. scheme between The Hong Kong Polytechnic University and Tongji University. The authors gratefully acknowledge the Department of Building and Real Estate at The Hong Kong Polytechnic University and the Research Institute of Complex Engineering & Management at Tongji University for providing supports to conduct this research.

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