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Severity of Corruption Factors in Project Life Cycle from Construction Experts' Perspectives

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Abstract: A study was conducted to identify whether corruption factors extracted from the literature review are relevant to the local construction industry. This study involves 13 construction experts that have been selected based on their experiences and prominent position in their respective organizations. All of the experts have a minimum of 10 years of working experiences, and their jobs are ranging from engineer to project manager. The experts were given a questionnaire and required to score the degree of severity to each of the 31 corruption factors in 4 stages of Construction Project Life Cycle (CPLC). Data collected from this study were analyzed descriptively using Average Index Score approach. The result of the study indicated that all the factors were getting scores ranging from 2.54 to 3.77, which indicates that the factors range from moderately relevant to extremely relevant from the viewpoints of the experts. Three highest scored factors are "High of competitions amongst contractor"; "Political influence in the design and tendering stage"; "Abuse of power from the client". Findings from this study can be further explored and applied to respective construction parties in decision making.

Keywords: Corruption, construction industry, risk management

1. Introduction

The construction industry is significant for Malaysia's economic growth, where it contributed 4.5% of the total GDP in 2018 and expecting growth estimated at 4.9% in 2019 (Ganeshwaran, 2019). Towards the transformation of the construction industry by the year 2020, the emergence of new technologies to the industry can increase the industry's growth by reducing operating cost such as 15 to 20% of the time in the design stage (Mohd Razali, 2018). Along with the appearance of the fourth industrial revolution or IR 4.0 which convert the construction industry in the direction of further digitally developed trades and contribute more in the economy and socio-economy aspects (Wesam et al., 2018).

Despite the contribution to the economic and Industrial Revolution 4.0, the construction industry is currently facing many challenges, especially corruption (Ang, 2017; Clement, 2017; Transparency International, 2019). Corruption Perception Index (CPI) rank for Malaysia is dropping significantly among 175 countries according to Transparency International as in Figure 1.0 (Trading Economy, 2019).
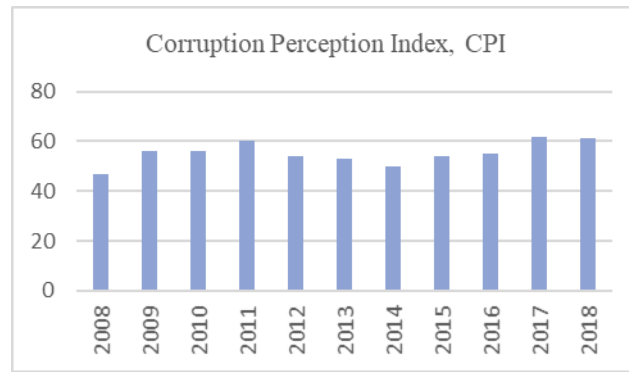
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Fig. 1 - Malaysia Corruption Perception Index

According to MACC (2019), majority of corruption report-ed cases from 2012 until 2018 are from the construction industry (Bernama, (i) 2019). Besides, the report on corruption trend from 2013 until 2018 shows that the public sector has been most vulnerable at an alarming rate of 63.33% (Bernama, (ii) 2019). Consequently, corruption comes at a cost such as higher prices for homes, lack of quality infrastructure, and negatively impacting the country economy (MACC, 2014; Locatelli et al., 2017). Thus, corruption becomes rampant and a major threat to Malaysia's National security (Bernama, (ii) 2019).

2. Corruption in Construction Industry

Corruption is defined as the abuse of entrusted power for private gain that can occur during any stage of the project life cycle (Stansbury, 2005; Transparency International, (ii) 2018). Corruption comes in many forms such as bribery, kickbacks, conflict of interest, extortion and nepotism (Fukuyama, 2005; So-hail & Cavill ,(ii) 2006; Kenny, 2006; Balboa et al., 2006; Kenny, 2007 (i); Kenny, 2007 (ii); Sohail & Cavill, (i) 2008; Ampratwum, 2008; Sohail & Cavill, 2008 (ii); Salim, 2009; Kenny, 2011; Olken & Pande, 2012; Wensik & De Vet., 2013; Shan et al., 2014; Kasimu & Kolawole, 2015; Wells, 2015; Hidayat & Mulyanto, 2016; OECD, 2016; Locatelli et al., 2017; Hadiwattege et al., 2017).

Corruption is a critical issue which has been long plaguing the construction industry. It has become a prevalent culture in the construction industry, as stated by Mohd Nordin in 2013. This situation becomes a threat to the government, economic, and social wellbeing of a community. The corruption is giving a bad image for the government, which would lead to degrading public trust (Gevansri, 2013). Furthermore, corruption discourages legitimate business investment and reduce public resources. It will also significantly impact the economic return on investment to a country while the socio impact of corruption reduces delivery of federal funds and services to the public, especially to the poor. Furthermore, corruption cause the project cost in-crease, which impacts the price of the house for buyers negatively.

Malaysia construction industry has also been facing the same issues with corruption; this is proven as many studies that have been carried out from 2011 until 2018. The studies vary from termination of contractor due to corruption practices; behavior contributes to corruption, factors towards corruption and case study on corruption in the construction industry (Has-san, 2011; Mohd Nordin, 2013;2014; Gevansri, 2013). In early 2019, the National Anti-Corruption Plan (NACP) documented a list of six risk areas of corruptions unusually public procurement in the construction industry and also been majority complaints of corruption compared to other industry (Prime Minister's Department, 2019).

Therefore, the fight against corruption becomes a priority in Malaysia. There are numerous institutions established by the government since Independence Day, as in Figure 2.
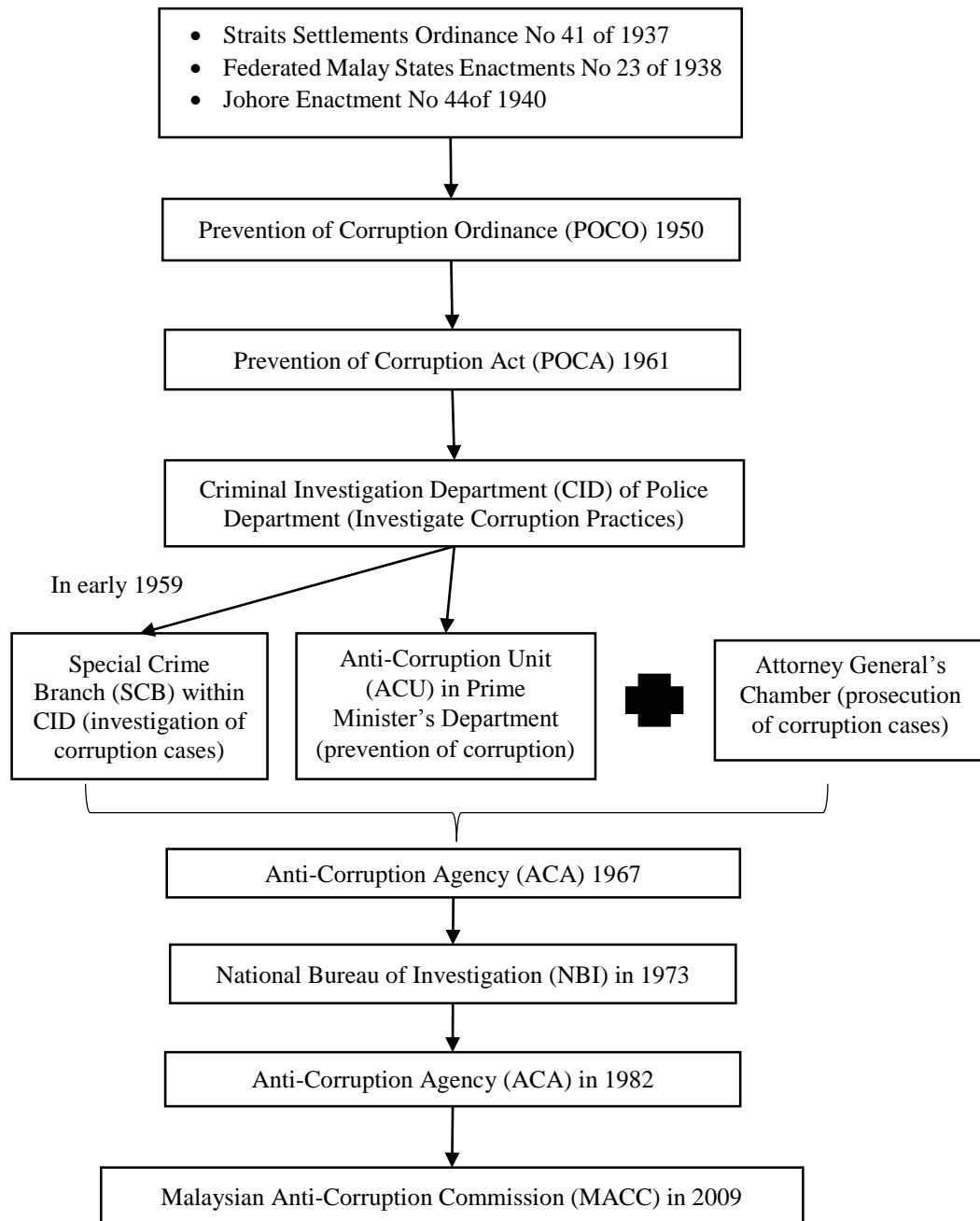
Fig. 2 - Adopted from Kapeli & Mohamed, (2015)

In June 2018, Governance, Integrity, and Anti-Corruption (GIACC) were established by Prime Minister, Tun Dr Mahathir Mohamad which will manage and monitor any activities related to governance, integrity and combating graft (Abas, 2018). The GIACC also responsible for planning, strategize and evaluate policies for government to achieve zero-tolerance towards corruption as the government manifesto.

Therefore, MACC developed strategies to combat the corruption which are 'Inspection & Consultancy Services,' 'Corporate Integrity Pledge (CIP),' 'Corruption Risk Management' and 'Establishment of Integrity Units' (MACC, 2018). Furthermore, MACC collaborates with every Ministry in the government to check the integrity to contribute for the Anti-Corruption Coalition for Construction Industry ("the Coalition") as a way of dealing with the rampant corruption.

In 2019, GIACC and the Prime Minister's Department are in collaboration with other government agencies developed the National Anti-Corruption Plan (NACP) which is an anti-corruption initiatives tool in realizing the government's vision towards a nation with integrity and free from corruption (MACC, 2019). The NACP contains 115 initiatives and 22 strategies in 6 priority areas which are political sector; public procurement; law enforcement; public sector administration; legislation and judiciary; as well as corporate governance (Bernama (iii), 2019). Despite those

strategies and a variety of policy initiatives, corruption still widespread in the construction industry (Siddiquee, 2010; Saieed, 2018).

3. Corruption in Construction Industry

This study has managed to identify 31 corruption factors which occurred in the construction industry based on literature from previous researchers. These factors were mostly classified in every phase of the construction project life cycle (CPLC). There are several classifications CPLC ranging from 4 to 7 phases, but this study has adopted only 4 phases of CPLC which are "Design & Tendering", "Construction", "Finishing", and "Maintenance" as in Table 1.

Table 1 - Corruption Factor by CPLC.

Corruption Factors	Stansbury (2005)	Zou (2006)	Sohail & Cavill i (2006)	Sohail & Cavill i (2008)	Salim (2009)	Hadiwattege et al, (2010)	K. Jha et al. (2010)	Erasmus & Pillay (2013)	Shabbir (2014)	Well (2015)	OECD (2016)	Frequency
Design & Tendering												
Erroneous detailing design						√	√			√		3
Technical specification is tailored for a specific company		√	√	√					√		√	5
Manipulation of contract details		√	√	√	√		√	√	√	√	√	9
Absence of public notice for the bidding process		√							√		√	3
Leakage of tender details (e.g. Baseline price)			√	√			√	√	√		√	6
Abuse of power from client			√	√					√	√		4
High of competitions amongst contractor	√	√	√	√	√				√		√	7
Fake certificates and credentials of contractor's company		√			√		√		√			4
Collusion between tenderer and public officer	√	√	√	√	√	√	√	√	√	√	√	11
Political influence	√			√		√	√		√	√	√	7
Conflict of interest and lack of integrity			√	√			√			√		4
Greediness of contractor and public officer			√	√		√				√		4
Getting quick project approval	√	√			√	√			√			5
Lack of supplier and networking					√	√		√		√	√	5
Construction												
Lack of supervision by consultant and authority		√			√		√					3
Collusion between contractors and officer		√		√	√				√	√		5
Complexity of project due to changes of variation									√			1
Manipulation of order (e.g. material & equipment)			√			√			√	√		4
Covering substandard work and materials	√	√		√	√		√					5
Theft of new assets before delivery or before being recorded			√	√							√	3
Avoiding tax, rules and specification	√	√	√	√					√			5
Construction does not comply with the design & specifications	√	√	√	√	√	√	√	√	√	√	√	11

cont. Table 1 - Corruption Factor by CPLC

Corruption Factors	Related Reference											Frequency
	Stansbury (2005)	Zou (2006)	Sohail & Cavill i (2006)	Sohail & Cavill i (2008)	Salim (2009)	Hadiwattege et al, (2010)	K. Jha et al. (2010)	Erasmus & Pillay (2013)	Shabbir (2014)	Well (2015)	OECD (2016)	
Finishing												
The contract price is not aligning with final cost	√					√						2
Manipulation of invoice and claims						√		√				2
Getting quick of progress payment and final cost evaluations	√			√	√						√	4
Avoiding contract inspection, delivery works and services			√	√				√				3
Maintenance												
Collusion between contractor				√		√			√			3
Lack of competition between maintenance contractor			√	√								2
Supply/using substandard materials and services	√		√	√					√			4
Lack of allocated funds for maintenance										√		
No proper record of maintenance works and supply		√			√	√						3

All these corruption factors in Table 1 were applied in this study questionnaire form.

4. Method of Data Collection and Analysis

A questionnaire was developed to solicit the perspectives and personal experience of experts in Malaysia's construction industry regarding the severity of the listed construction corruption factors in Malaysia's industry. The structured questionnaire is divided into two parts, first of which are demographics of respondents and secondly, the severity of construction corruption factors. The severity of construction corruption factors was assessed using a 5-point Likert scale as in Table 2.

Table 2 - Severity Based on 5-Point Likert Scale

Scale	1	2	3	4	5
Level	Not relevant	Slightly relevant	Moderately relevant	Relevant	Very Relevant

The collected data from the questionnaire survey were analyzed using Average Index (AI) Formula (Memon et al., 2011) as below:

$$Average\ Index = \frac{\sum(1X_1 + 2X_2 + 3X_3 + 4X_4 + 5X_5)}{\sum(X_1 + X_2 + X_3 + X_4 + X_5)}$$

(1)

Where;
X1 = Number of respondents for scale 1
X2 = Number of respondents for scale 2
X3 = Number of respondents for scale 3
X4 = Number of respondents for scale 4
X5 = Number of respondents for scale 5

The AI values can be classified into the five categories of relevant level as adopted from Memon et al. (2011) as below:

- Not Relevant (NR): $1.00 < AI < 1.50$

- Slightly Relevant (SR): $1.50 < AI < 2.50$
- Moderately Relevant (MR): $2.50 < AI < 3.50$
- Very Relevant (VR): $3.50 < AI < 4.50$
- Extremely Relevant (ER): $4.50 < AI < 5.00$

The AI is used to assess the factors and any Moderately Relevant (MR) which is 2.50 will be eliminated as a score of anything below 2.50 will be considered not relevant for this study.

5. Method of Data Collection and Analysis

The study was conducted to identify whether the corruption factors that were extracted from the literature review are relevant to Malaysia construction industry scenarios. A total of 13 construction experts were selected based on their experiences and position in handling construction projects. An engagement using face-to-face questionnaire technique with the experts was conducted from November 2018 to December 2018 where the experts were explained the intention of the study and shown the questionnaire for them to score on the severity of the corruption factors using 5-points Likert's scale. The demography of the experts is as shown in Table 3.

Table 3 - Demography of Experts

Age	Academic Level	Experience (years)	Grade of Company (Contractor)	Amount of Project Involved	Position	Facing Corruption
Between 36 and 45	Bachelor Degree	16 to 20 years	Grade 7	RM 500,001 – RM 1 million	Project Engineer	No
Between 36 and 45	Bachelor Degree	11 to 15 years	JKR	RM 5 million – RM 10 million	Project Engineer	Yes
Above 45	Bachelor Degree	16 to 20 years	Grade 7	More than RM 10 million	Project Manager	Yes
Between 26 and 35	Bachelor Degree	11 to 15 years	Grade 4	RM 3 million – RM 5 million	Project Engineer	Yes
Above 45	Bachelor Degree	21 to 25 years	Grade 7	RM 500,001 – RM 1 million	Engineer	Yes
Above 45	Bachelor Degree	26 to 30 years	Grade 7	More than RM 10 million	Project Manager	Yes
Between 26 and 35	Diploma	11 to 15 years	Grade 3	Less than RM200,000	Assistant Manager	Yes
Between 26 and 35	Bachelor Degree	11 to 15 years	Grade 7	More than RM 10 million	Engineer	Yes
Above 45	Bachelor Degree	21 to 25 years	Grade 4	RM 1 million – RM 3 million	Engineer	No
Between 36 and 45	Bachelor Degree	16 to 20 years	JKR	More than RM 10 million	Engineer	No
Above 45	Bachelor Degree	26 to 30 years	JKR	More than RM 10 million	Senior Engineer	No
Above 45	Bachelor Degree	21 to 25 years	Grade 7	RM 5 million – RM 1 million	Assistant Manager	Yes
Between 36 and 45	Master Degree	16 to 20 years	JKR	More than RM 10 million	Building Surveyor	No

By using the experts in Table 3, which are from diverse backgrounds, experiences, and positions have indicated that the questionnaire is valid as the experts have given positive feedback regarding the face validity of the items listed in Table 3.2. While using Cronbach's Alpha, it is shown that the questionnaire that was used is considered reliable as it has produced a consistent result. This is indicated by the Cronbach's Alpha value of 0.935, which shows a high level of internal consistency from the experts on 31 construction corruption factors in CPLC phases and the values are shown in Table 3.1.

Table 3.1 - Cronbach's Alpha Value by CPLC phases

CPLC phases	Cronbach's Alpha Values
Design and Tendering	0.904
Construction	0.886
Finishing	0.696
Maintenance	0.854

Based on Table 3.1, the Cronbach's Alpha values are between 0.696 until 0.904. As Awang (2012) stated if the data is more than 0.67 it is considered to be valid and reliable.

Table 3.2 shows the Average Index Value for construction corruption factors.

Table 3.2 (a) - Design and Tendering Phase

Corruption Factors	Average Index
High competitions amongst contractors	3.77
Political influence	3.38
Abuse of power from client	3.25
Greediness of contractor and public officer	3.23
Getting quick project approval	3.23
Lack of supplier and networking	3.15
Leakage of tender details (e.g. Baseline price)	2.92
Conflict of interest and lack of integrity	2.92
Manipulation of contract details	2.85
Absence of public notice for the bidding process	2.77
Erroneous detailing design	2.69
Technical specification is tailored for a specific company	2.69
Fake certificates and credentials of contractor's company	2.62
Collusion between tenderer and public officer	2.62

Table 3.2 (b) - Construction Phase

Corruption Factors	Average Index
Manipulation of order (e.g. Material & Equipment)	3.23
Complexity of project due to changes of variation	3.15
Covering substandard work and materials	3.15
Collusion between contractors and officer	3.08
Theft of new assets before delivery or before being recorded	3.00
Construction does not comply with the design & specifications	2.92
Avoiding tax, rules and specification	2.85
Lack of supervision by consultant and authority	2.69

Table 3.2 (c) - Finishing Phase

Corruption Factors	Average Index
The contract price is not aligning with final cost	3.00
Avoiding contract inspection, delivery works, and services	3.00
Manipulation of invoice and claims	2.92
Getting quick of the progress payment and final cost evaluations	2.54

Table 3.2 (d) - Maintenance Phase

Corruption Factors	Average Index
Supply/using substandard materials and services	2.85
No proper record of maintenance works and supply	2.85
Lack of allocated funds for maintenance	2.69
Lack of competition between maintenance contractor	2.62
Collusion between contractor	2.54

For Design and Tendering Phase in Table 3.2(a), the three most relevant corruption factors are '*High competitions amongst contractors*'; '*Political influence*' and '*Abuse of power from client*'. While in Table 3.2 (b) which is the

Construction Phase, the three most relevant corruption factors are '*Manipulation of order (e.g. Material & Equipment)*'; '*Complexity of project due to changes of variation*' and '*Covering substandard work and materials*'. Subsequently, in Table 3.2 (c) which is in the Finishing Phase, the three most relevant corruption factors are '*The contract price is not aligning with final cost*'; '*Avoiding contract inspection, delivery works and services*' and '*Manipulation of invoice and claims*'. Finally, for the last phase which is Maintenance Phase in Table 3.2 (d) the three most relevant corruption factors are '*Supply/using substandard materials and services*'; '*No proper record of maintenance works and supply*' and '*Lack of allocated funds for maintenance*'. The result of data analysis found out the construction corruption factors are above moderately relevant towards the Malaysian construction industry.

6. Conclusion

Corruption practices are still rampant in Malaysia's construction industry. The fight against corruption becomes Malaysia's top-most priority as NACP 2019 is established. This study identified 31 relevant corruption factors throughout the construction project life cycle (design & tendering; construction; finishing and maintenance). The identification of these corruption factors can be further to investigate the risk level of each corruption factors in the construction industry. This result will help to alert the construction community on the potential of corruption practices which may occur and also support the Government's initiatives to combat Corruption in Malaysia.

Acknowledgements

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