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### A Structure Equation Modeling of Guidelines for Preventing Corruptions in Industrial Business Organizations

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#### ABSTRACT

Currently corruptions are widely and increasingly encountered by every sectors including industrial business. This study aimed to find guidelines for preventing corruptions in industrial business organizations and to develop a structure equation model. Quantitative and qualitative research methods were employed in this study. The quantitative data were obtained from interviewing 500 internal auditors of industrial business. The analysis of the developed structure equation model showed that it was in accordance and harmony with the empirical data and passed the evaluation criteria. Its chi-square probability level, relative chi-square, goodness of fit index, and root mean square error of approximation were 0.126, 1.165, 0.972, and 0.018 respectively. The statistical significance of this study was set at 0.05.

**Keywords:** Structure equation modeling, preventing, corruptions, industrial business.

#### 1. INTRODUCTION

As the competition in economics is becoming more violent, administrators increasingly encounter a number of problems and obstacles in their business. Corruption in organizations is considered a very serious problem that is expanding rapidly. It is known that network of corruptions has been made systematically covering the whole world through globalization. This damages economics of both individuals and the country. It also damages business credibility and economic stability. Transparency International provides an annual corruption perception index (CPI) scoring countries worldwide on how corrupt their public sector is seen to be, and indicating their corruption rank. (Transparency International, 2017)

**Table 1**  
**CPI of ASEAN countries from 2015-2016**

<i>Countries</i>	<i>Year 2015</i>		<i>Year 2016</i>	
	<i>Score</i>	<i>World Rank</i>	<i>Score</i>	<i>World Rank</i>
Republic of Singapore	85	8	84	7
Malaysia	50	54	49	55
Thailand	38	76	35	101
Republic of Indonesia	36	88	37	90
Republic of the Philippines	35	95	35	101
The Socialist Republic of Vietnam	31	112	33	113
The Lao People's Democratic Republic	25	139	30	123
Union of Myanmar	22	147	28	136
Kingdom of Cambodia	21	150	21	156
Global average score				43

*Source:* Corruption Perceptions Index 2016, by Transparency International, 2017.

Table 1 shows CPI in ASEAN countries from year 2015-2016. It can be seen that only two countries, namely, Republic of Singapore and Malaysia were scored above the global average score of 43 out of 100. Republic of Singapore earned 84 points and Malaysia 49 while the other countries including Thailand were below the average. It is obvious that even though Republic of Indonesia, The Socialist Republic of Vietnam, The Laos' People Democratic Republic and Union of Myanmar were below average, they scored more in year 2016 than in year 2015 while The Philippines' and Kingdom of Cambodia's score remained unchanged. Regarding Thailand, its score was 36 with PCI rank of 76 in year 2015 and then fell to rank 101 with the score of 38, 3 point increase in year 2016 (Transparency International, 2017), worsening the corruption perception of the country. According to the mentioned ranking, it seems that Thailand is at a medium or high risk of corruptions. The progress of technology, and complication of corruptions makes it more difficult to prevent corruptions of all forms. (Vorapong, 2014)

Corruption problems not only have a direct impact on economic sector but also are risk factor of reputation, brand, quality, services as well as morale of employees working in industrial businesses with high risk of corruptions. They are like cancer damaging organizations. When problems rooting from corruptions occur, organizations cannot put the blame on or push the burden of responsibility to any employees, suppliers, or local trading partners but they have to set up an efficient management system, covering the whole organizations, to deal with the problems.

## 2. LITERATURE REVIEW

Corruption problems are currently remarkable in many countries especially in those developing ones. They undermine the countries' growth worldwide (The Securities and Exchange Commission, 2015). Factors promote ones to commit corruptions include (1) people being dishonest, (2) opportunity inviting corruption commitment, and (3) motivation or suffer (Thanin, 2015). These similar factors are also mentioned in American Standards of Accounting and Donald Cressey's triangle theory of corruption (Tommie & Aaron, 2010; Martin, 2013). Guidelines for preventing corruptions, presumably, consist of four elements, namely, ethics implantation, internal control, internal audit, and penalty for those who get caught of corruption.

### 3. HYPOTHESES

This study aimed at guidelines for preventing corruptions in 4 aspects; ethics implantation, internal control, internal audit, and penalty. The hypotheses of the study were as follows:

**H1:** Ethics implantation factor directly influenced internal control factor.

Personnel is an important factor to run organizations effectively while the efficiency of internal control is affected by personnel's behavior and habits (Pickett, 2010). It is, therefore, necessary for an internal control body to have efficient standard to prevent dishonest personnel from committing corruption (Lynford, 2015).

**H2:** Ethics implantation factor directly influenced internal audit factor.

Corruptions in organizations can occur both in public and private sectors of not only developing countries but also the developed ones. Corporate governance is believed to be a way to solve these problems. Cooperation, however, is required from every party in the organization including audit committee, external auditors, and internal auditors (Justine and John, 2013) all of whom must be ethical themselves (Gael, 2014).

**H3:** Internal control factor directly influenced penalty factor.

The objectives of the internal control are to manage the organization, to use resources effectively, to take care of properties, and to prevent and reduce mistakes leading to corruptions. No matter how effective the internal control is intended to be, it cannot be guaranteed that such objectives can be achieved because some limitations do inevitably exist. Rules and regulations must, therefore, be issued (Robert, 2013; Amy & Lisa, 2015). Penalty must also be imposed due to the violation of those internal control guidelines.

**H4:** Internal audit factor directly influenced internal control factor.

As operational characteristics of organizations vary, it is necessary for them to have an appropriate internal audit practice so that they know the strength and threat of their own system (Pickett, 2014). Internal auditors' job is to examine and evaluate whether the created system is efficient enough to reduce opportunities and risk leading to corruptions, and to prevent them in every unit of the organization (Robert, 2016).

**H5:** Internal audit factor directly influenced penalty factor.

Internal audit is an important tool or mechanism for developing an organization so as to be a good corporate governance unit. Effective internal audit can alleviate managerial burden resulting in management fluidity (Pickett, 2010). Internal auditors are responsible for giving honest, complete, and accurate opinions to administrators, assisting them in decision making, as well as in setting aside penalties for offenders to prevent improper behavior (Robinson, 2012).

**H6:** Penalty factor directly influenced ethics implantation factor.

Lawrance Kohlberg pointed out the relationship between punitive variables and ethical variables. He conducted a research on ethical development basing on Piaget's theory and found that human ethics resulted from intellectual process (Sohan & Celia, 2012). According to Kohlberg, ethics is divided into 3 levels of 6 stages. Level 1 stage 1 is called pre-conventional level. At this level human beings use their intellect to judge whether their action is moral or not from the penalties received (William, 2014). So punishment affects moral demonstration of human beings.

#### **4. RESEARCH METHODS**

This study was of an inductive research type. Mixed-methodology, qualitative and quantitative, was employed to conduct the research. For qualitative method, in-depth interview and focus group were organized. Four latent variables; namely, ethics implantation, internal control, internal audit, and penalties; and 100 observed variables were set.

The population of the qualitative method was nine well-accepted experts to be interviewed in depth, and 7 for focus group. The population for the quantitative method was 3,218 internal auditors being members of The Institute of Internal Auditors of Thailand (The Institute of Internal Auditors of Thailand, 2017). The sample size was set based on Comrey and Lee's criteria (Lawrence, Glenn & Guarino, 2017). The samples of this study were 500 internal auditors.

The instruments of this study were check-list and rating scale questionnaires. Likert's five-point-rating scale was used (David & Sutton, 2011, p. 259). The analysis of the questions and the objectives revealed that the IOC of 100 observed variables ranged from 0.60-1.00. The reliability of the questionnaire calculated by using Cronbach's Alpha coefficient was 0.985. Corrected item-total correlation was employed to find out the discrimination of the questionnaire. The discrimination value obtained ranged from 0.31 - 0.87. Interview was used to collect the data from the samples obtained through multi-stage sampling technique (Babbie, 2015).

Descriptive and referential statistics as well as multivariate statistical analysis were used to develop the structural equations modeling (SEM). SPSS and AMOS software were used for evaluating the data-model fit of four levels (Arbuckle, 2011, pp. 555-556) which were (1) Chi-square probability level of < 0.05, (2) Relative chi-square of > 3, (3) Goodness of fit Index of < 0.90, and (4) Root mean square error of approximation of > 0.08.

#### **5. RESULTS OF THE STUDY**

The results of the study were as follows:

- 5.1 The internal audit unit in organizations was not dependent on any units (49.00%). There were more than 10 internal auditors in organizations (41.00%). Internal audit personnel was assigned to participate in conference and seminar organized by external agencies for knowledge development (54.00%). Clear internal auditing was regularly made and planned, and open to other units (65.80%). Random auditing technique was used (38.60%). According to the internal auditing, most corruptions were committed by operational staff (41.80%) in procurement unit (30.40%). Cash (49.80%) was most found being embezzled (35.80%) by one corruptor (36.20%) resulting in business loss of 1-2% of the total sale (46.00%). Due to the examination, chance of committing corruptions was little (42.40%) and the amount of the loss was not so big (42.40%). The discovery of corruptions was due to suspicions found by internal auditors (35.80%). Corruptions were mostly committed during October and December (41.00%). Lack of internal control motivated corruptions (24.40%). Extravagance was the major cause of employees' corruptions (20.20%). Lack of internal control gave opportunities to corrupt (40.40%). Mistakes were usually found after internal auditing, but did not much affect the business operation as they could be corrected rapidly (44.40%). Audit results were disclosed in the committee meeting (44.80%).

5.2 Top three preferable guidelines for preventing corruptions in organizations in relation to ethics implantation as rated by the samples were: Administrators should behave themselves as a moral role model ( $\bar{X} = 4.36$ ). Organization of ethics should be built through organizational culture ( $\bar{X} = 4.26$ ). Ethics should be set as a part of the achievement target of organizations ( $\bar{X} = 4.18$ ).

Guidelines for internal control yielded from the study were that: examination and approval should be made in every stage ( $\bar{X} = 4.32$ ). Command line should be imposed with clear job description for check and balance ( $\bar{X} = 4.29$ ). A safety system for keeping important financial and accounting documents should be provided ( $\bar{X} = 4.28$ ).

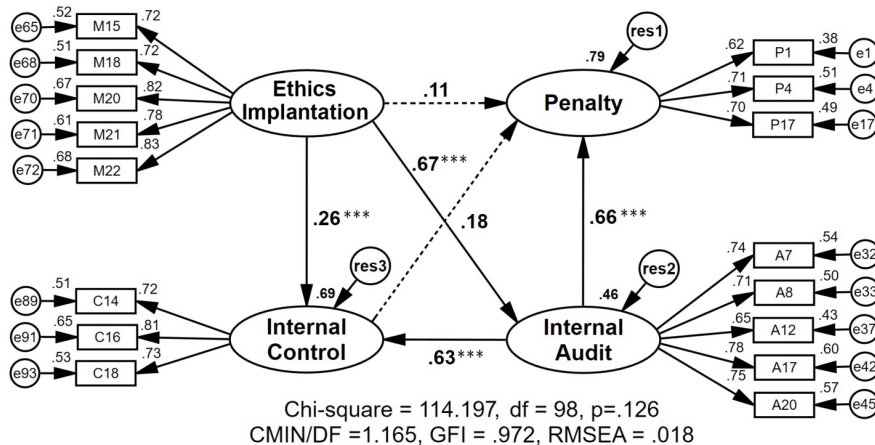
Guidelines related to internal audit included: Internal auditors must not have conflict of interest against the practice for organizational transparency ( $\bar{X} = 4.41$ ). An internal audit unit should be set up in organizations and be free to work ( $\bar{X} = 4.40$ ). The audit committee must be independent of executive committee to promote free internal and financial audit ( $\bar{X} = 4.37$ ).

Guidelines concerning penalty: Clear penalties must be imposed for offenders ( $\bar{X} = 4.37$ ). Allow the accused to provide evidences and witnesses for fairness ( $\bar{X} = 4.32$ ). Related evidences and documents must be kept confidential if the investigation and penalty processes have not been finalized ( $\bar{X} = 4.31$ ).

5.3 The comparison of guidelines for preventing corruptions gained from industrial business organizations of different sizes showed that medium and small size organizations had more ethical ways for preventing corruptions than the large ones at the statistical significance level of 0.05. No differences were found in preventive guidelines related to internal control, internal audit, and penalties.

5.4 The harmony with the empirical data of the developed model before being improved indicated that the root mean square error of approximation was 0.068, passing the criteria, but the chi-square probability level, relative chi-square, and goodness of fit index did not.

The model was, therefore, improved taking into consideration the modification indices as advised by Arbuckle (2011, pp. 107-109). After the improvement the model's chi-square probability level, the relative chi-square, the goodness of fit index, and the root mean square error of approximation were 0.126, 1.165, 0.972, 0.018 respectively, passing the criteria as shown in Figure 1 and Table 3 below.



**Figure 1: The structure equation modeling of guidelines for preventing corruptions in industrial business organizations after being improved**

**Table 2**  
**Meaning of variables**

<i>Variables</i>	<i>Meaning</i>
M 15	Allowing the personnel to participate in activities promoting organizational ethics.
M 18	Basing on philosophy of sufficiency economy.
M 20	Organizing continuous trainings on ethics for personnel.
M 21	Organizing activities for exchange and hearing of opinions for work improvement and transparency.
M 22	Having a person awarded for morality to share his/her experience to personnel.
C 14	Providing a list of signatures of those authorized to sign for comparison.
C 16	Following up works to lessen the length of the unfinished job.
C 18	Placing purchase order appropriate to usage.
A 7	Using modern information technology system in auditing job.
A 8	Having external advisors to analyze and evaluate the results of the internal audit.
A 12	Providing constant evaluation of internal audit efficiency.
A 17	Checking the exception report when any mistakes in work system occur.
A 20	Providing risk evaluation in internal audit.
P 1	Setting up legal unit in organization.
P 4	Improving rules and regulations that tend to promote corruptions.
P 17	Adjusting the penalties already imposed must be approved by the stakeholder committee.

**Table 3**  
**Statistics figures obtained after the model was improved**

<i>Variable</i>	<i>Standardized Estimates</i>	<i>R<sup>2</sup></i>	<i>Variance</i>	<i>C.R.</i>	<i>P</i>
Ethics implantation					
Internal Control	0.26	0.69	0.12	4.46	***
Internal Audit	0.67	0.46	0.18	11.71	***
Penalty	0.11	0.79	0.06	1.74	.082
Internal Control					
Penalty	0.18	0.79	0.06	1.84	.066
Internal Audit					
Internal Control	0.63	0.69	0.12	9.10	***
Penalty	0.66	0.79	0.06	6.48	***

5.5 The hypothesis test revealed the following:

5.5.1 Ethics implantation factor directly influenced internal audit and internal control at a statistical significance level of 0.001. The factor loading was 0.67 and 0.27 respectively, but it did not directly influence the penalty factor at a statistical significance level of 0.05 and the factor loading was 0.11.

5.5.2 The internal control factor did not directly influence the penalty factor at a statistical significance level of 0.05 and the factor loading was 0.18.

5.5.3 The internal audit factor directly influenced the penalty and internal control a statistical significance level of 0.001 and the factor loading was 0.66 and 0.63 respectively.

## 6. DISCUSSION

Six interesting issues of the findings should be discussed as follows:

- 6.1 Industrial business placed more importance on guidelines for preventing corruptions in internal audit than in other matters. This finding supported Michael and Gubin (2012)'s belief that guidelines for internal auditing inserted in international standards were a more valuable tool for fighting corruptions than any others available nowadays, and industrial business, therefore, placed much importance on internal audit. Pickett (2014) also agreed that efficient internal audit could well prevent corruptions.
- 6.2 Medium and small industrial business organizations had more preventive guidelines related to ethics than the large ones did. This finding met Charles, James & Ramesh (2014) and Deunden, Weerawan, Pornchai, & Sirikan (2011)'s opinion that large business normally had fair and transparent managerial policy as well as clear corporate governance system of their own, unlike the medium and the small ones that always lacked efficient internal control and audit as they were usually developed from family business, and so allowed corruptions to be committed easily. It was often found that corruptors were those who were neither moral nor honest enough (Pornthep, 2015). So medium and small businesses realized the importance of ethics. Tayakorn (2013)'s study also pointed out that entrepreneurs in medium and small establishments placed an importance on business with ethics at the highest level.
- 6.3 The hypothesis test indicated that ethics implantation factor directly influenced internal control. According to Socrates and Plato's principles, it is believed that morality will lead to good life and proper behavior (Popkink & Stroll, 1993: p. 3). It is dangerous for organizations to have low morality personnel (Taya, Panter, Nazly, Lily & Yeonjeong, 2014). Puspasari & Suwardi (2016), and Steven (2015) found in their study that a factor promoting corruptions was individual's morality. Any organizations with low morality personnel should provide concise internal control to shut chances of corruptions. On the contrary, organizations with high moral personnel did not suffer from corruptions no matter whether they had an internal control unit or not. It can be assumed that level of individual's morality matters and triggers internal control.
- 6.4 Due to the hypothesis test, the study indicated that ethics implantation factor directly influenced internal audit. This finding is similar to that of Khelil, Hussainey & Noubbigh's (2016) who found that personnel' morality affected internal audit in the way that auditors had to be more careful when auditing units whose personnel used to commit corruptions.
- 6.5 The finding that internal audit factor directly influenced internal control does support internal audit guidelines, indicating that auditors are not responsible for preventing corruptions but checking and assessing whether the internal control measure is sufficient. Their role is to give administrators advice on working efficiency improvement, and effectiveness increase in internal control as well as to assure that resource is used properly so that the administrators can use internal control as a mechanism to monitor the internal control process, eventually resulting in the decrease of corruptions in the organizations. (Tusek & Ivana, 2016; Phanit, Panudda, & Sirinprapa, 2005)

- 6.6 Regarding the finding that internal audit factor directly influenced penalty, it confirms Robinson (2012)'s saying that penalty imposition is for preventing personnel's improper behavior. In addition to giving honest, complete, and accurate opinions to administrators, auditor should impose appropriate penalty for offenders to prevent improper behavior. An auditor is an important person for this matter.

## 7. SUGGESTIONS

According to the findings of this study, four guidelines for preventing corruptions in industrial business organizations are suggested as follows:

- 7.1 Ethics implantation. Administrators should be a role model in behaving themselves morally. They should not corrupt for themselves or partisans, but encourage their supervisees to be honest, to hate corruptors, to fight against corruptions; praise the good doers; and culture all of these as organizational morality so as to sustainably prevent corruptions.
- 7.2 Ethics may be hard to implant in every organization member. So it is necessary to establish a concrete and efficient internal control unit with reasonably expense. Personnel should strictly observe rules and regulations under the control of this unit. Then corruptions can be prevented effectively.
- 7.3 Internal audit is a measure that can promote efficient internal control in organizations. Periodical and continuous auditing should, consequently, be made. Auditors should be equipped with modern information technology since auditing job is much related to analysis and evaluation of financial and accounting data as well as performance.
- 7.4 Penalty may not be only one way out to totally eradicate corruptions, but it can be, to some extent, of use to prevent them as it acts like a rule for employees to work together in organizations. Penalty should, however, be clearly imposed, and appropriate to a particular offense. In addition, fairness and equality must be recognized. Social sanction is suggested as one of penalty measures to prevent corruptions in organizations.

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