Measurement model of good governance in government procurement

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Abstract. This research aimed to develop competency factors for Good Governance in Government Procurement. The research adopted structural relationship models and is descriptive in nature. The research sample was drawn from 353 government sectors. The research tool was an expert questionnaire which had content validity and reliability of 0.986. The data was statistically analyzed by 1) exploratory factor analysis and 2) second-order confirmatory factor analysis. The research found that the model for the Good Governance in Government Procurement had high construct validity by both exploratory and confirmatory factor analysis. The model composed of 1 factor and 14 sub-factors from 15 selected variables.

1. Introduction

Good Governance was a universal principle recognized by international institutions that it was a crucial factor in making an organization be successful [1]. Also, it was recognized among international development organizations as the concept and key factor that helped to promote sustainable development. The “level of corporate governance” and the “level of political responsibility” are the main criteria used to determine the funding for any country [2], with serious policy implementation by reducing poverty, developing democracy, and developing the management of transparency with responsibility [3].

Good Governance was absolutely essential for Thailand [4]. After the economic crisis in 1997, Good governance had a negative impact on all sectors of the society with some partial causes from national administration and management as well as the organizations in public and private sectors which were defective and ineffective including wrongdoing, corruption, and the lack of ethics. This had a negative impact on all sectors of society with some partial causes from national administration and management and the organizations in public and private sectors which were defective and ineffective; including wrongdoing, corruption and the lack of ethics [1]. Under the Government Procurement and Supplies Management Act B.E. 2560, published in Government Gazette Volume 134, Section 24 Kor, dated on
February 24, 2017 [5], Good Governance was an important principle in the development of Electronic Government Procurement (e-GP) which was the central government procurement information center to provide public and private agencies with access to public procurement and government procurement resources in Thailand. From the study about a variety of perspectives on various aspects regarding the use of Electronic Government Procurement: e-GP, there were no effective electronic procurement policies and practices to achieve the stated objectives [6]; Vaidya et al., 2004), and most applications did not take into enough efficiency and effectiveness in terms of value and risk from the use of electronic government procurement [7]. Moreover, [8]. believed that the appropriate management of electronic government procurement could reduce corruption in government agencies, and public procurement practices often reflected tensions between public expectations about high governance standards, management requirements for operating performance. [9] [10]. Electronic government procurement had also proven itself to be a more effective and sufficient tool [11].

Currently, it was not known exactly what were the critical factors of good governance in public procurement; especially, electronic government procurement (E-Government Procurement: e-GP). Until now no study on Good Governance in electronic government procurement using component analysis has been found. [12]. Therefore, the researchers team is keen to develop the component of Good Governance in the government procurement in order to strengthen the administration and management of the government procurement system. Good governance in the government procurement will bring peace and benefit Thailand in terms of fast and sustainable development.

2. Conceptual framework of the study

Good governance originated as a condition of the World Bank's funding to developing countries [13] to prevent inefficient operation and government corruption of the borrower's government [1] [5]. Then, there were many organizations focusing on the Good Governance such as the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the United Nations Development Program (UNDP), and the Organization for Economic Co-operation and Development (OECD).

Good governance occurred and linked to societies in both Macro and Micro levels, and the Institute on Governance (IOG) [12] stated that good governance had covered areas into four levels: (1) Global Governance which referred to all the factors involved in the globalization process such as organizing international community governance rules to solve international problems or between states to unconstitutional states, including the rules and international regulation on commodity stability of economic, capital, and goods, (2) National Governance – covering all relevant political, economic and governance standards, and consisting of Administrative law, Political Cost-effectiveness, and New Institutionalism [14-16], (3) Organizational Governance consisted of guidelines or management paradigms. If it was a government organization, it would be two approaches to public management. The first one focused on management principles that paid attention to work or performance which was derived from the mandates and was subject to the constraints as they were, which was the concept of short-term public management principle. This principle was weighted for the permanent job within the organization [11] [17]. The second one emphasized the importance of the role of public managers as mandatory. Authorized Public managers had the political power within the organization to build networks of relationships and co-operation between different sectors of the society, which was the concept of long-term public management principle [18], and (4) Community Governance was the community operation by good governance factors.

The researcher created a model showing the assumptions of factors of good governance in government procurement, as shown in “Fig. 1”, The research hypothesis consisted of (1) the studied variables which could be classified into the exploratory factors analysis of good governance in government procurement, and (2) confirmatory factor analysis of good governance in government procurement which was developed with integrity.
3. Methods

The study methodology of this study was the descriptive research by using structural relationship model and consisted of two steps.

3.1. Population and Samples

Consisted of 3,025 projects of government procurement (Information from January 2014 to January 2015). The samples used for collecting data were from 353 projects of government procurement project in accordance with the formula of Taro Yamane (1967: 886) at a confidence level of 95% from the statistical analysis condition of Factor Analysis; that is, there must be more than 300 samples [19] with Systematic Random Sampling [20].

3.2. Study instruments and their quality control

Consisted of a questionnaire divided into two sections: 15 items for the general information of respondents and 15 items for the good governance in government procurement. The questions on the questionnaire were the 5-level rating scale type, and quality of the study instruments was all content validity and reliability (α) of 0.986.

3.3. Data Collecting

Data Collecting was from Web Surveys [20] published on the website of Government Procurement system (www.gprocurement.go.th) between April 2016 and May 2016 with the samples, and 353 questionnaires were returned, representing 100 percent of the identified samples.

3.4. Data Analysis of Research

Data Analysis of Research was divided into two sections consisted of (1) Exploratory Factor Analysis from the data of qualified persons, using the statistical value of Exploratory Factor Analysis from Principal Component Factor Analysis and Orthogonal rotation by Varimax with consideration of factor loading focusing on weighting higher than 0.30. Then, the statistical value of each factor derived from

![Figure 1. Conceptual framework of Study.](image-url)
the exploratory factor analysis was taken into comparison with the factors from the literature review; including the name of the factor with the analysis of Cronbach's alpha for each factor [21]. (2) Confirmation factor analysis from the data collection in Section 3.3 from the statistical value of confirmatory factor analysis for checking the harmony of each variable with empirical data by Pearson's product-moment correlation coefficient was used as the basic information for factor model analysis. Composite factor model test with consistency index included Chi-Square, Relative Chi-Square (CMIN / DF), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), and reliability was considered on the significance of Standardized Factor Loading, Standard Error (SE), t-test, and Observed Variance which were described by Squared Multiple Correlations (SMC).

4. Result

4.1. The results of exploratory factor analysis (EFA)

The results of suitability tests of the studied variables were analyzed by using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, and it was found that KMO was 0.956 which was greater than 0.80, indicating that the variable of this set was suitable for the factor analysis at an outstanding level according to the criteria of Kim and Mueller [22]. Bartlett's Test of Sphericity was also used, and it was found that there were statistically significant correlations at 0.001, which could be used for factor analysis.

Principal Component Analysis: The Communality of each variable was used for the factor analysis of good governance in government procurement with a total of 15 factors, ranging from .552 to .812, size of medium to large, and tended to be able to fit into one of the components. The result of Orthogonal Rotation by the Varimax method was shown in Table 1. The number of factors, variance of variables, percent variance, and cumulative percent variance of good governance factors in government procurement based on the factor with the Eigenvalue as greater than 1 that there was only one factor and could explain the variance of all variables equivalent to 68.863 percent.

4.2. Results of confirmatory factor analysis

The results of the consistency analysis showed that the confirmatory factors analysis about good governance model in government procurement had statistical values that were unqualified. Therefore, it was necessary to adjust the model to be more harmonious. The researcher had adapted the model based on the recommendation from the Model Modification Indices (MI) by cutting off one unqualified variable, namely the Responsiveness (GG03), the modified model analysis, and the chi-square test without significance (P-value = 0.074). The chi-squared correlation was 1.334. The NFI index was 0.989. The GFI index was 0.978. The CFI index was 0.997. The standardized RMR was 0.006. Moreover, the RMSEA was 0.031. As a result, the whole statistic values became the qualified ones which showed that the model of good governance in government procurement was consistent with empirical data as shown in “Fig. 2” and Table 2.

Based on the results of Table 1, it was found that the good governance model in government procurement had factor loading at the range between 0.686 and 1.102, and the variance describing the good governance model in government procurement was 45.8 to 81.4 percent. The highest factor loading was the morality (β = 1.102); followed by transparency (β = 0.934), cost-effectiveness (β = 0.902), predictability (β = 0.899), equality (β = 0.892), and the lowest one was consistency (β = 0.073).

5. Discussion

The result of the exploratory factor analysis of good governance in government procurement was found that all 15 studied variables could be grouped into one factor. The factor had Eigen value greater than 1.00. Variability of all variables could be explained by the factor or 68.86%. The factor loading of each variable varied from 0.780 to 0.882. The analysed variables could be used for the study of good governance in government procurement. This was because these variables were documented, and research supported. The researcher had also studied widely relevant papers and research papers. Thus, the key variables we got were consistent and covered the larger structure of good governance that could
be grouped into one factor already and the result of confirmatory factor analysis of good governance in government procurement was found that confirmatory factor model of good governance consisted of one main factor and 14 sub factors. Considering the importance of morality in government procurement, it was the first important principle with similar factor loading. It also corresponded to the research of [10] [12] [14-15] [23] that adhered to goodness by promoting the state officials to abide by this government procurement in performing their duties as examples to society and encouraging the stakeholders to develop themselves. The transparency of government procurement was consistent with the Government Procurement and Supplies Management Act B.E. 2560 [5] [23], which was the disclosed action to give a chance to have a fair competition with the equal treatment for all entrepreneurs and to have a reasonable and enough time to submit proposals with the clear evidence of operation and disclosure of procurement and inventory management information at all steps. Cost-effectiveness was consistent with the Government Procurement and Supplies Management Act B.E. 2560 [5] which required quality or features that served the intended purpose of use by the government agency with well-priced items and had an appropriate and clear facilities management plan. Good governance in government procurement consisted of two main dimensions: (1) the process of building relationships between the government, society, private sectors, and the public to make the administration work effectively, transparently, and (2) good or fair administration and governance consisted of three factors namely transparency, accountability, and efficiency [1] [12] [23].

Figure 2. The second confirmatory factor model of good governance in government procurement.

6. Conclusion
The results of the exploratory factor analysis of good governance in government procurement showed that there was 1 factor of factor structure from 14 selected variables. The results of confirmatory factor analysis of good governance in government procurement was found that the factor model had good structural integrity since the model was consistent with the empirical data with the qualified statistic of harmony integrity since the model was consistent with the empirical data with the qualified statistic of harmony measurement, and the chi-squared statistic did not have significance (P-value = 0.074). The Chi-square correlation coefficient was 1.334. The NFI index was
0.989. The GFI index was 0.978. The CFI index was 0.997. The standardized RMR was 0.006, and the RMSEA value was 0.031. All statistics met the required criteria and could be sorted according to the top 5 main factors from the highest to the lowest, consisting of morality, transparency, cost-effectiveness, predictability, and equality, respectively.

Table 1. The first confirmatory factor model of good governance in government procurement.

| No. | Item          | Good Governance | EFA Factor Loading | Standardized Factor Loading | SE   | t-test | SMC |
|-----|---------------|-----------------|-------------------|----------------------------|------|--------|-----|
| 1   | GG08 Morality | 0.870           | 1.102             | 0.118                      | 10.380** | 0.776 |
| 2   | GG15 Transparency | 0.806 | 0.934 | 0.061 | 17.087** | 0.678 |
| 3   | GG09 Economy | 0.882           | 0.902             | 1                          | **   | 0.814 |
| 4   | GG12 Predictability | 0.780 | 0.899 | 0.249 | 4.409** | 0.458 |
| 5   | GG06 Equity | 0.881           | 0.892             | 0.042                      | 23.033** | 0.796 |
| 6   | GG07 Rule of Law | 0.880 | 0.885 | 0.38  | 25.329** | 0.784 |
| 7   | GG05 Accountability | 0.854 | 0.849 | 0.041 | 23.152** | 0.720 |
| 8   | GG01 Effectiveness | 0.818 | 0.768 | 0.044 | 19.013** | 0.589 |
| 9   | GG02 Efficiency | 0.799           | 0.753             | 0.042                      | 18.408** | 0.568 |
| 10  | GG10 Participation | 0.839 | 0.747 | 0.059 | 14.391** | 0.667 |
| 11  | GG04 Decentralization | 0.794 | 0.688 | 0.080 | 9.436** | 0.556 |
| 12  | GG13 Combating corruption | 0.793 | 0.686 | 0.060 | 12.703** | 0.610 |
| 13  | GG11 Consensus | 0.843           | 0.641             | 0.173                      | 4.396** | 0.706 |
| 14  | GG14 consensus-oriented | 0.793 | 0.073 | 0.385 | 0.212** | 0.582 |

Remark: ** referred to the 0.01 level of significance and * referred to the 0.05 level of significance

Table 2. Goodness of – fit measurement of factor model and empirical data regarding good governance model in government procurement.

| Index         | Criteria            | Before adjusting model | After adjusting model |
|---------------|---------------------|------------------------|-----------------------|
|               |                     | Statistic              | Result of Consideration | Statistic | Result of Consideration |
| X²/df         | < 3.00              | 9.167                  | Unqualified           | 1.334     | Qualified               |
| p-value of X² | > 0.05              | <0.001                 | Unqualified           | 0.074     | Qualified               |
| NFI           | > 0.90              | 0.851                  | Unqualified           | 0.989     | Qualified               |
| GFI           | > 0.90              | 0.730                  | Unqualified           | 0.978     | Qualified               |
| CFI           | > 0.95              | 0.864                  | Unqualified           | 0.997     | Qualified               |
| RMR           | < 0.08              | 0.019                  | Unqualified           | 0.006     | Qualified               |
| RMSEA         | < 0.08              | 0.152                  | Unqualified           | 0.031     | Qualified               |
| Reliability   | > 0.70              | 0.967                  | Qualified             | 0.966     | Qualified               |

Note: the p-value Also Sensitively to sample size more than 200.

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