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Benefit Evaluation Model of E-Government Procurement

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ABSTRACT

Since 1990s, Information Technology has developed at speed. With the development of IT and Internet, E-Government affair has become the focus of every government. As an important part of E-Government Affair, E-Government Procurement has a great influence on the development of economy. Based on the situation of Government Procurement of China, this paper states the importance of benefit evaluation of government procurement, and attempts to build up the benefit evaluation system model of Government Procurement in China, separately from economic benefit, political benefit and social benefit. Further more, some criteria for the information collection of E-government Procurement will be summarized.

Keywords: E-Government; E-Government Procurement; Government Procurement Agreement (GPA); WTO; Benefit Evaluation System; criteria system; Analytic Hierarchy Process (AHP)

1. INTRODUCTION

E-government is a kind of application information system realized by information technology, which is used to serve the detailed business, transaction, and conference of government. It is on the basis of the substantial government organization and resources in the Internet. Concretely speaking, E-government is a kind of behavior pattern of government depending on the Internet, which is closely related to the government management and society business service.

E-government is the result of Information Technology Revolution. In the face of the challenge of IT and Information Society, E-government development has become the focus of every country in the world. As result, the efficiency of government and service quality is improved by IT, at the same time the competitive power of the country is increased greatly to be against the challenge of Information Society through E-government. At present, E-government development are accelerated in all the countries in the world, which is not only important to improve the efficiency of government affairs and public service, but also especially important to improve the transparency and democratization of government.

Until to 2003, all office business has been put on the Internet in American Federation Institutes and Singapore government; government of Japan launched the project "new era" in February, 2000 and planed to perform all the government business during the period from 2003 to 2005; until 2002, 41% of citizens in U.K. were served mainly by the website of government institutes of U.K.

According to the report of world economic forum: the maturity degree of E-Government in China is 23%, which is still in the stage of building the basic frame. Three kinds of information system of E-Government

have been set up in our country: office system network among government departments; information sharing and real time online communication between all the functional government departments; information dual-communication between the government and citizens through the Internet. Some foreign academic institutions have put forward some evaluation standards for E-government, but in China there is still not a uniform, scientific evaluation criteria system for E-government, which draws attention of the academicians in China.

2. OVERVIEW OF GOVERNMENT PROCUREMENT

As one important part of the E-Government system, government procurement is the key node of public financial system, which is one of basic methods by which financial management and payment of the government is carried on under market economy system. According to government procurement agreement (GPA) in WTO, government procurement is defined as: the purchase and lease of the goods, service, projects of the central government and sub -government of member countries in WTO, and foundation of public facilities. Generally speaking, the procurement of central government takes on about 10-15% of GDP.

From 1990s on, with the development of IT and popularization of the Internet, government procurement on the Internet has become one of the main parts of government procurement revolution in many countries. The advantages of E-procurement are shown below:

- a. Time saving. During the whole E-procurement process, time is greatly reduced and procurement efficiency is greatly improved.
- b. Cost cutting. During the E-procurement, almost all the payment on the printing and posting can be saved, and workload is reduced, so that the cost of procurement is greatly

- reduced.
- c. "Open, justness, justice" principle sufficiently sticking to. The reduction of information asymmetry and corruption can make competition in government procurement market more sufficient and closer to "business in the sunlight".
 - d. Effective and active government impression shaping. With the application of modern network in E-procurement, government shows aggressive and revolutionary spirit, which strengthens the belief of the citizens to government as result.

In China, government procurement is still a new thing. In the middle of 1990s, some provinces in China began to test the government procurement reformation, and it is Shanghai city that was first to try the reformation, and it is Shenzhen city that was first to set up the regional law for government procurement.

At present, government procurement is in the process of change from primary phase to entirely developing phase. In 2002, government procurement was supported by all levels of governments and parties, and received great achievement that the total procurement broke through 100 billion RMB, 100.96 billion. According to the statistic data from 37 provinces, the target of government procurement is 113.54 billion RMB in 2002, and the real payment is actually 100.96 billion, the cash saving is 12.58 billion RMB, ratio is 11%.

3. BENEFIT EVALUATION SYSTEM MODEL OF GOVERNMENT PROCURMENT

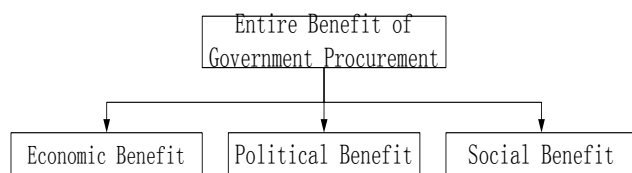


Figure 3.1: The structure of government procurement benefit

3.1 Economic Benefit Evaluation System

3.1.1 Evaluation Criteria

➤ Capital Total of Government Procurement

This criterion reflects the scale of procurement of a country or a district. At the same time, it is the basis of international comparison, to measure the development degree and total level of government procurement. For example, in 1998, the capital saving ratio of government procurement is 13.38%, higher than 12.96% of 2000, but the scale of the later is ten times of the former, the total capital saving increased from 4150 million RMB in 1998 to 4.25 billion RMB in 2000. This comparison shows, total capital of government procurement is

highly related to economic benefit, which is the basis of economic benefit evaluation.

➤ Ratio between procurement capital and GDP or Finance Expense

These two criteria reflect the importance of government procurement to national economy and finance expense. According to the experience of developed countries, the usual value of these ratios is between 10% and 30%, generally speaking, the more these ratios are closer to these numbers, the more benefit is obvious.

➤ The Product and Value Framework of Government Procurement

Now there are three products for government procurement in the world: goods, project and service. Generally speaking, if all the products focus on goods, this fact shows that the government procurement of this country or district is still in the primary stage, although benefit is goods, but the scale is not large enough, the levels are not enough, as the result, there would not be obvious total benefit, just like China. If the distance among three kinds of products, or the later two are larger, the fact shows that government procurement goes into the higher stage, goes deep into all the parts of economic area. At this time, the scale of total government procurement is larger, and total benefit and framework benefit becomes more obvious.

➤ Capital Saving Ratio

Usually this ratio for government procurement represents the difference between separate procurement expense and government procurement expense, divided with total procurement capital, but now people often use the difference between budget of government procurement and actual government procurement contracts to compute the capital saving ratio. The formula shows as following:

If P_{budget} denotes budget of government procurement, $P_{contract}$ denotes actual government procurement contracts, then

$$\text{Capital saving ratio} = \frac{P_{budget} - P_{contract}}{P_{budget}} \times 100\%$$

Generally speaking, the more this ratio is higher, the more the benefit of procurement is more obvious. Therefore, at present the high capital saving ratio in China illustrates the fact that the budget management in China has been too loose for long time, which also reflects the necessity of government procurement system. For long term, cost saving ratio of government procurement is the scientific basis for evaluating procurement benefit.

➤ Development Speed

The formula is below:

If $P(t)$ denotes the procurement capital of t year, then

$$\text{Development Speed} = \frac{P(t) - P(t-1)}{P(t-1)} \times 100\%$$

This formula reflects the dynamic development of government procurement. On one hand, high speed illuminates great progress has been achieved on the procurement work; on the other hand, it illuminates former radix is too small, the procurement is still on the primary stage and has great room and potential to develop. For example, in China, there is 3.1 billion RMB of procurement in 1998; but in the following two years, the procurement developed in the speed of 300%, the total scale of government procurement expended greatly and same things happened to the economic benefit.

3.1.2 Economic Benefit Evaluation System of Government Procurement

Based on the statement above, Following is economic benefit evaluation system of government procurement.

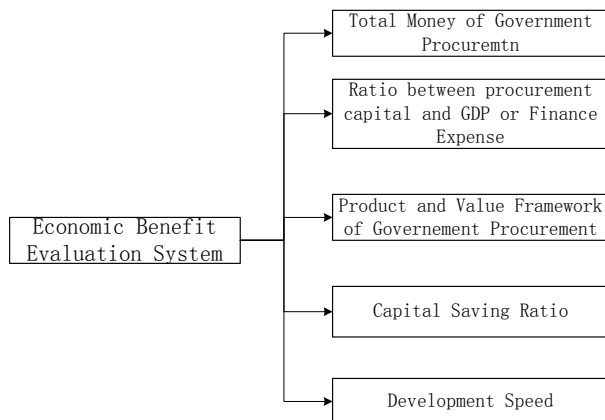


Figure 3.2 Economic Benefit Evaluation System of Government Procurement

3.2 Political Benefit Evaluation System

3.2.1 Evaluation Criteria

Political benefit of government procurement needs to be evaluated and analyzed by qualitative method. Government procurement carries on the policy mainly through accelerating social stabilization, protecting national industries to realize government benefit.

➤ Benefit Evaluation of accelerating social stabilization

Stabilization is the most important to politics, to maintain social stabilization is the greatest political benefit. Government procurement maintains the social stabilization through two ways: macroscopical adjustment and control; directly expand occupation.

Government procurement is an important tool to macroscopically adjust and control national economy. As the largest consumer, government owns the largest procurement scale in mass time. As a result, it would have great influence on macroeconomics operation. At the same time, government can adjust the procurement structure to adjust the industry structure, so such adjustment of economic period would benefit for stable increase of economy.

Government procurement can also increase the occupation. Occupation is a serious political problem, because it is directly related to social stabilization, related to people's basic welfare. Especially during the period of economy stagnancy, government can expand social infrastructure to increase occupation.

Based on the analysis above, we can use two ratios to measure the benefit of accelerating social stabilization: economy development ratio and the ratio of employment by social infrastructure.

➤ Benefit Evaluation of protecting national industries

National industries involves with national benefit, which is also a political problem. Increasing government procurement makes China more import to the world. Usually we set up related laws for government procurement to protect domestic government procurement market.

United Nation has passed some related laws and requirements to clear the trade obstacle to guarantee trade liberty, and make sure that there is no discrimination for foreign suppliers. On the other hand, under certain condition, foreign suppliers are restricted to restrict take part in the government procurement in order to protect some key departments of the country from too much international competition. Foundation and improvement of government procurement system is absolutely necessary for protecting national political benefit.

Based on the statement, we attempt to use the number of related procurement laws and requirements, and the ration between the procurement from foreign suppliers and total government procurement that reflects the international degree of government procurement.

3.2.2 Political Benefit Evaluation System of Government Procurement

Based on the statement above, Following is economic benefit evaluation system of government procurement.

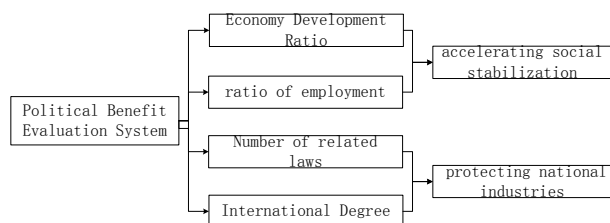


Figure 3.4 Political Benefit Evaluation System of Government Procurement

3.3 Social Benefit Evaluation System

3.3.1 Evaluation Criteria

Protecting environment, fighting against poverty, maintaining social order, belong to the benefit of public product. In order to realize these goals, government procurement needs to make some standards to evaluate its social benefit. According to welfare economic theories, increase in social benefit depends on the increase in social welfare, and increase in social welfare depends on whether personal welfare level is improved.

Although at present social benefit evaluation of government procurement is still neither complete nor correct, but from the analysis, evaluation result, we can conclude: although there are still many problems during the process of government procurement in China: just began to develop recently and the scale and scope is not large enough, the speed of development is high, the trend and progress of development is significant.

Actually, on maintaining the social order and clearing social ethos, China has achieved obvious social benefit through government procurement. Government procurement system makes enterprises realize that if one enterprise wants to win the government procurement market, it must depend on its credit and strength, it must train a sale force with high quality, which know everything about government procurement. As a result, many enterprises set up their own website to satisfy the requirements of E-government procurement, at same time make them famous and get more information of others, at the end improve the management level of their own.

Opening is the basis of justness. Justness can standardize the social order so that social benefit can be produced. The key to work out this problem is to complete and improve the present government procurement system further from the legislation.

At present, it is not obvious for government procurement to influence the social benefit from anti-poverty and environment protection, the main reason lies on the narrow scope of government procurement in China, there are still many products not included into the scope of procurement. At the same time, there are also some problems in the design of policy goals. Most government procurement focus on

economics goals, political goals and social goals still need more attention.

Based on the analysis above, we can illustrate the social benefit through two criteria: degree of justice, that is ratio between the number of the enterprises who own their own website among the suppliers and the number of the enterprises who are the suppliers of government procurement; degree of procurement public bidding, that is the ratio between procurement by public bidding and total procurement capital. These two formulas are following:

If N_w denotes the number of those enterprises who own their own websites among the suppliers; N_s denotes the number of the enterprise who are the suppliers of government procurement; $P_{bidding}$ denotes the procurement by public bidding; P_{total} denotes the total procurement capital.

$$\text{Degree of justice} = \frac{N_w}{N_s} \times 100\% ;$$

$$\text{Degree of publicity} = \frac{P_{bidding}}{P_{total}} \times 100\% .$$

3.3.2 Social Benefit Evaluation System of Government Procurement

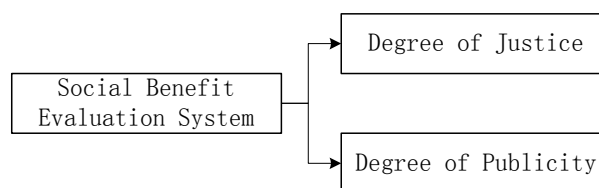


Figure 3.4 Social Benefit Evaluation System of Government Procurement

4. MULTICRITERIA EVALUATION METHODS INTRODUCTION

The multicriteria evaluation is widely used in the social life, recent years there are many multicriteria methods emerging, mostly used are AHP (Analytic Hierarchy Process), DEA(Data Envelope Analysis), PCA (Principal Components Analysis), and Expert Analysis. From benefit evaluation system, we can see that there are many criteria to evaluate benefit of government procurement, and AHP is the most suitable method for benefit evaluation of government procurement.

In the 1970s, AHP was invented by T. L. Satty, who was an American expert of operational research. AHP has been used to system analysis and strategy research in the area of economy and politics, with the characteristic of practicability, terseness and validity. The process of AHP includes problem conceptualization, hierarchy structure foundation, consistency judgment matrix formation and so on, consistency judgment matrix formation is one of the key steps. This method can be used to research more complex multicriteria decision

problems, quantify the qualitative factors, to some extent test and reduce the subjective influence, and make the evaluation more scientific. In 1982, Mr. Xu shubai introduced it into China.

When the entire benefit of government procurement is evaluated by using AHP, first step is to separately, evaluate economic benefit, political benefit and social benefit, then get the values of each benefit; second step is to give weight to each benefit according the opinion of the decision maker, at last add up these weighted values, then get the final evaluation value. Decision makers can compare evaluation values of some years to give some advices for developing and improving government procurement work.

5. INFORMATION COLLECTING OF GOVERNMENT PROCUREMENT

From the analysis above, some information needs to be collected to convenience the benefit evaluation of government procurement. Such information can be divided into two types: statistic information, statement information. For statistic information, there is horizontal information, longitudinal information, annual statistic and so on, in the form of digital information. On the other hand, statement information is mainly the information that describes the characteristic of government procurement behavior, in the form of letters. Based on the former analysis, we get the a brief summarization of information collecting of government procurement:

Table 5-1 Information Collecting

Statistic information	Statement information
Monthly procurement	Type of procurement product
Annual procurement	Import or export
Finance expense	Degree of justness
Budget of procurement	Degree of publicity
Actual contracts sum	----
Laws of procurement	
District procurement	

During the process of government procurement, the information mentioned above should be paid more attention in order to evaluate the benefit of government procurement efficiently, effectively, conveniently.

6. CONCLUSION AND FUTURE RESEARCH WORK

As an important part of E-Government, E-Government Procurement has a great influence on the development of economy. Government procurement is one key node in the public finance system, which is one of the basic methods to perform the national finance management and payment in the system of market economy. Because

the characteristic of Government procurement is "justness, justice, open", it can greatly prevent the malversation, such as some personal operation and corruption, as a result usually the government procurement can be called as "project in the sun". Normative government procurement has the important meaning to the incorruption in the government. How to realize E-government, and how to use present information technology to evaluate the whole benefit of government procurement, that is the present focus of government affairs.

As the situation of global government procurement shows, E-government procurement is inevitable, which is the direction of government procurement reformation. In term of the general rules of E-government procurement, together with the fact in China, the basic design of E-government procurement is: strengthen the research and programming of E-government procurement, establish the mutual mechanism of government procurement reformation with E-government procurement step by step.

In China, the benefit evaluation of government procurement is still on the primary stage and still in the process for groping. In fact, most present evaluations are focus on the economic criteria, not social criteria and political criteria, and ordinarily strained to a few special criteria for quantity analysis. On the other hand, the result of evaluation is often affected by the value judgment, knowledge, experience of person who is making the evaluation, as well as by the quantity of the material and the relationship between the person making evaluation and the object evaluated, what is mentioned above will finally influence the justness and objectivity of the evaluation results.

This paper attempted to set up the evaluation system of the whole benefit for government procurement, separately from economic benefit, social benefit and political benefit three parts to explain the source of government procurement benefit. According to the different type of benefit criteria, different quantity and qualitative methods are used to evaluate the benefit: concretely speaking, for economic benefit, measure criteria are used; for social benefit and political benefit qualitative criteria are used.

The future research work will focus on exploration of the evaluation method for the enterprise procurement in or out of China, and those of government procurement in developed countries, some reasonable advice from the above will be provided for building a China-fitted evaluation criteria system according to China's situation. Scientific, reasonable, standardized benefit evaluation system for government procurement can make the evaluation process more easily, operation more conveniently, the time for evaluation less, at the same time, the lessons and experience of procurement can be summarized in time, as a result government

procurement becomes more transparent and more “sunlight”.

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