

Research to advance the evaluation methodology of public works projects

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1. Introduction

Public works projects of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) are evaluated three times: when a project is newly adopted, when re-evaluated, and after the project is completed, and many evaluations are done every year. Evaluation methods are not completed, so to perform more appropriate project evaluations, it is necessary to continuously review the methodology and to improve it based on social and economic conditions and ongoing survey research. So now since setting the social discount rate and dealing with uncertainty have a great impact on project evaluation results, the surveys and points of contention are organized with the two themes.

2. Setting the social discount rate

In an incomplete market where there are distortions caused by taxes and by asymmetric information, there is no agreement on which rate to use as the social discount rate, and each country and organization sets this rate based on its own information. Table 1 shows the values of the social discount rates and their setting methods in the major industrialized countries.

As overall trends, in the industrialized countries of North America and Oceania, it is set as relatively high values between 7% and 8% based mainly on the return rate on investment of private sector, but in the United Kingdom, France, Germany and other industrialized countries of Europe, the rates are between 3% and 4%, mainly as values based on the social time preference. In Japan, 4% is set as the average of real yields on long-term government bonds as the opportunity cost of capital, making Japan a member of the lower group among the major industrialized countries.

The major points of contention concerning a more appropriate social discount rate in Japan are as follows : [1] suitability of the method of calculating the social discount rate, [2] considering intergenerational equity related to policies which impact multiple generations, [3] propriety of adopting a time declining discount rate, and [4] the appropriate way to deal with the uncertainty of the social discount rate.

3. Dealing with uncertainty

Because public works projects are long term, the future cost, effectiveness, and project duration etc.

may change. So when a project is evaluated, these

Table 1. Social Discount Rates in Major Industrialized Countries

Country	Social discount rate	Calculation method
United States.	7%	Return rate on investment of private sector
Canada	8%	Weighted mean of private sector return rate and market interest rate
New Zealand	8%	Return rate on investment of private sector (capital asset pricing model)
United Kingdom	3.5%	Social time preference (Ramsey equation)
France	4%	Social time preference (Ramsey equation)
Germany	3%	Yield on long-term government bonds
Japan	4%	Yield on long-term government bonds

changes, or in other words, the uncertainty, must be considered. One method of considering uncertainty is sensitivity analysis of cost-benefits analysis, and the Technological Guidelines to Cost-Benefits Analysis of Public Works Project Evaluation (General Principles) (revised by MLIT in June 2009), stipulates implementing the sensitivity analysis when making cost-benefits analysis.

The major points of contention concerning dealing with uncertainty including sensitivity analysis are as follows: [1] methods of systematically accumulating, organizing and analyzing the results of foreign and domestic project evaluations (particularly, the post project evaluation), [2] organizing and analyzing causes of and response to uncertainty, [3] improving technologies for sensitivity analysis, and [4] establishing uncertainty evaluation methods including items which cannot be converted to monetary value.

4. Future initiatives

Setting the social discount rate and dealing with uncertainty will continue to be organized and analyzed with the focus on points of contention, contributing to the advance of project evaluation methods.