Applications of Stated Preference (SP) Techniques for Public-Private Partnership (PPP) Projects in Developing Countries

Prapatpong Upala (Ph.D.)
Academic Lecturer,
Faculty of Architecture, King Mongkut's Institute of Technology Ladkrabang

Abstract:

Discrete Choice Modelling (DCM), especially Stated Preference (SP) techniques, have been used to evaluate the effects of relevant attributes (attribute valuation) of a system on individuals' responses, calculate the value of money, and provide forecasts of changes in travel demand. SP techniques are especially useful for studying non-existing market situations, such as improving public transport services, building new mass transit line, building new motorway/tollways, and implementing road pricing. SP techniques have been widely used for over three decades, while Public-Private Partnership (PPP) projects have been initially introduced the private finance initiative (PFI) in the United Kingdom for two decades. The objective of this paper is to introduce SP techniques, and its applications in developing countries, particularly for PPP projects. In order to apply effectively SP techniques for Public-Private Partnership projects in developing countries, and to consider some key issues of SP techniques, such as SP experiment design, measurement of attributes, data collection method, respondents' understanding of new scenarios, and some key issues of Public-Private Partnership (PPP) projects in developing countries, such as unclear governing framework, fragmented authorities, time consuming procedure, Insufficient institutional support, and lack of rules and capacity with respect to risk allocation.

Keywords : Discrete Choice Modelling (DCM), Stated Preference (SP) techniques Public-Private Partnership (PPP), Developing Country

1. Introduction

Public-Private Partnership (PPP) is a range of possible relationships among public and private entitles in the context of infrastructure and the other services. Effective PPPs recognize that the public and the private sectors each have certain advantages, relative to the other, in performing specific tasks. The structure of the partnership should be designed to allocate risk to the partners who are best able to manage those risks and thus minimize cost while improving performance (Asian Development Bank, 2008). Now, PPPs have been an important tool for implementing Infrastructure and Mega-projects both of developed world and developing countries, especially transportation projects. The benefit of PPPs is that government could be utilized the private sector's resources, such as private funding, professional technicians, innovative technology, and sharing financial in delivering infrastructure projects. Initially, most public-private partnerships were negotiated individually, as one-off deals. In 1992, the first systematic program - private finance initiative (PFI) - aimed at encouraging PPPs by the UK government. This program focus was on reducing the Public Sector Borrowing Requirement. Five years later, the new government persisted with the PFI

sought to shift the emphasis to the achievement of "value for money (VfM)" mainly through an appropriate allocation of risk (Wikipedia, 2009). Recently, value for money is acceptability for the one of the key benefits of a PPP arrangement. VfM defined as the optimum combination of whole-of-life costs (cost of finance, transaction costs, and the costs of monitoring and supervision) and quality of the good or service to meet the user's requirements. Generally, the private sector will bring risk management benefits and efficiencies. Once of the challenges in evaluating PPPs is to determine the Value for Money proposition taking into account the relevant factors, which will include the quality of the service provision as well as the overall costs and associated risks (Samir, 2008).

During the last three decades, Discrete Choice Modelling (DCM), especially Stated Preference (SP) techniques, have been used to evaluate the effects of relevant attributes (attribute valuation) of a system on individuals' responses, calculate the value of money, and provide forecasts of changes in travel demand. SP techniques are especially useful for studying non-existing market situations, such as improving public transport services, building mass transit line, building new motorway/tollways, and implementing road pricing.

The objective of this paper is to introduce SP techniques, and its applications in developing countries, particularly for PPP projects. In order to apply effectively SP techniques for Public-Private Partnership projects in developing countries, and to consider some key issues of SP techniques, such as SP experiment design, measurement of attributes, data collection method, respondents' understanding of new scenarios, and some key issues of Public-Private Partnership (PPP) projects in developing countries, such as unclear governing framework, fragmented authorities, time consuming procedure, insufficient institutional support, and lack of rules and capacity with respect to risk allocation. Apart from the introduction, the remaining of the paper is organized section by section. The second section presents the concept of PPP approach. Later, SP techniques are provided in this section. The challenges of the SP applications for Public-Private Partnership (PPP) projects in developing countries are described at the end of the paper in the last section

2. Public-Private Partnership

Public-Private Partnership (PPP) is a concept that involves the public and private sectors working in cooperation and partnership to provide infrastructure and services. Nowadays, PPPs are increasingly playing a role within the developing world (Samir, 2008). PPPs are a variety of structure and contractual format. Basically, contractual format are (Details of contract format and its characteristics summarised in Table 1:

- Service contracts;
- Management contracts;
- Lease contracts;
- Build-operation-transfer (BOT) and similar arrangements;
- Concessions; and
- Joint ventures.

Table 1 Key features of the basic forms of Public-Private Partnership (PPP)

Features	Service Contracts	Management Contracts	Lease Contracts	Concessions	BOT
Scope	Multiple contracts for a variety of support service such as meter reading, billing, etc.	Management of entire operation or a major component	Responsibility for management, operations and specific renewals	Responsibility for all operations and for financing and execution of specific investment	Investment in and operation of a specific major component, such as a treatment plant
Asset Ownership	Public	Public	Public	Public/Private	Public/Private
Duration	1-3 years	2-5 years	10-15 years	25-30 years	Varies
O&M Responsibility	Public	Private	Private	Private	Private
Capital Investment	Public	Public	Public	Private	Private
Commercial Risk	Public	Public	Shared	Private	Private
Overall level of Risk Assumed by Private Sector	Minimal	Minimal/ Moderate			
Compensation Terms	Unit prices	Fixed fee, preferably with performance incentives	Portion of tariff revenues	All or part of tariff revenues	Mostly fixed, part variable related to production parameters
Competition	Intense and ongoing	One time only; contracts not usually renewed	Initial contract only; subsequent contract usually negotiated	Initial contract only; subsequent contract usually negotiated	One time only; often negotiated without direct competition
Special Features	Useful as part of strategy for improving efficiencyof public company; Promotes local private sector development	Interim solution during preparation or more intense private participation	Improves operational and commercial efficiency; develops local staff	Improves operational and commercial efficiency; Mobilizes investment finance; Develops local staff	Mobilizes investment finance; Develop local staff
Problem and Challenges	Requires ability to administer multiple contracts and strong enforcement of contracts laws	Management may not have adequate control over key elements, such as budgetary resource, staff policy, etc.	Potential conflicts between public body which is responsible for investments and the private operator	How to compensate investments and ensure good maintenance during last 5-10 year of contract	Does not necessarily improve efficiency of ongoing operation; May require guarantees

(Adapted from Heather Skilling and Kathleen Booth, 2007 from ADB, 2008)

Asian Development Bank (2008) proposed the four issues to diagnostic PPPs process for designing, selecting contractual form, and implementation include:

- Technical issues;
- Legal, regulatory, and police frameworks;
- Institutional and capacity, and
- Commercial, financial, and economic issues.

In this paper is focus on the commercial, financial, and economic issues, particularly financial issue. Generally, financial considerations relate to the design of detailed and realistic pricing (including customer tariffs, off-take agreement, etc.) strategies. The objective is to provide affordable service, encouraging use, while providing the private partner with revenue sufficient for commercially viable operations. Sometimes, the government's provision of financial support through investment contribution or other forms of "viability gap" support or even ongoing subsidies can achieve this balance. Financial indicators and models would be useful for evaluation PPPs project such as, Project Internal Rate of Return (or Project IRR), Return on Equity (or Project ROE), Annual Dept Service Coverage Ratio (ADSCR), Loan Life Debt Service Cover Ratio (LLCR), Net Present Value (NPV) of Subsidies. Details of financial indicators and formula summarised in Table 2.

Table 2 Financial indicators and its formula

Financial Indicators	Formula
Project Internal Rate of Return (or Project IRR)	$\sum \frac{Ri - li - Ci}{(1+r)^i} = 0$ **Where** *Ri* is the operating revenue at year *i* *li* is the amount invested at year *i* *Ci* is the operating cost at year *i* r is the project's internal rate of return **Remarks** An attractive IRR would be high, preferably above 7-8% in terms, depending on countries and financial markets.
Return on Equity (or Project ROE)	$\sum \frac{Di - li}{(1+r)^i} = 0$ **Where** Di is the dividend at year i li is the amount invested by shareholders at year i r is the project's internal rate of return Remarks The project is profitable for the shareholders when r is high.
Annual Dept Service Coverage Ratio (ADSCR)	$ADSCRi = \frac{CBDSi}{DSi}$ **Where** *CBDSi* is the cash flow before debt service at year *i* (the cash remaining in the project company after operating costs and taxes

Financial Indicators	Formula
	are paid) *DSi* is the debt service remaining at year i (principal and interest) **Remarks** The project may be considered viable for lender when ADSCR is greater than one for every year of the project life. This means that if project revenue is below what was forecast in the financial model at year *i*, the project company should still be able to repay debt. Generally, the minimum ADSCR should be greater than 1.1 or 1.2
Loan Life Debt Service Cover Ratio (LLCR)	$LLCRi = \frac{NPV(CBDSi \rightarrow end)}{Dsi \rightarrow end}$ **Where** NPV(CBDSi-end) is the net present value of the cash flow before debt service from year i to the end of the debt repayment period *DSi-end* is the total of debt service remaining at year *i* (principal and interests) **Remarks** The project is estimated viable for the lenders when the LLCR is high for every year of the project life. This means that the project company should be able to repay the debt despite a period of cash shortfall.
Net Present Value (NPV) of Subsidies	$NPV = \sum_{t=1}^{T} \frac{Rt}{(1+i)^t} - Ro$ **Where** *t* is the cash flow period *Rt* is the cash flow at year *t* *i* is the interest rate assumption *Ro* is the initial cash investment **Remarks** If a project is subsidized over several years, the net present value of these payments gives the real amount of subsidies as if they were paid in a lump sum at present year, neutralizing the effects of inflation.

Skilling and Booth (2007) summarised the role of stakeholders in the PPP process into five groups as follows,

(1) Political decision makers

- Establish and prioritize goals and objectives of PPP and communicate these to the public
- Approve decision criteria for selecting preferred PPP option
- Approve recommended PPP option
- Approve regulatory and legal frameworks

(2) Company management and staff

- Identify company-specific needs and goals of PPP
- Provide company-specific data
- Assist in marketing and due diligence process
- Implement change

(3) Consumers

- Communicate ability and willingness to pay for service
- Express priorities for quality and level of service
- Identify existing strengths and weaknesses in service

(4) Investors

- Provide feedback on attractiveness of various PPP options
- Follow rules and procedures of competitive bidding process
- Perform thorough due diligence resulting in competitive and realistic bidding

(5) Strategic Consultants

- Provide unbiased evaluation of option for PPP
- Review exiting framework and proposes reforms
- Act as facilitator for cooperation among stakeholders

In conclusion, the three main needs that motivate governments both of developed world and developing world to enter into PPPs for infrastructure are: (1) to attract private capital investment (often to either supplement public resources or release them for other public needs); (2) to increase efficiency and use available resource more effectively; and (3) to reform sectors through a reallocation of roles, incentives, and accountability (ADB, 2008).

3. Stated Preference Techniques

Preference (also called "taste" or "penchant") is a concept, used in the social sciences, particularly economics. It assumes a real or imagined "choice" between alternatives and the possibility of rank ordering of these alternatives, based on happiness, satisfaction, gratification, enjoyment, utility they provide, More generally, it can be seen as a source of motivation. In cognitive sciences, individual preferences enable choice of objectives/goals (Wikipedia, 2009).

There are two types of the preference data, including Revealed Preference (RP) and Stated Preference (SP). The SP data (also called: hypothetical situation) aims to ask people hypothetical questions for determining people responses from choice scenarios and to estimate money value in term of Willingness-To-Pay (WTP) or Willingness-To-Accepts (WTA). On the contrary, the RP data (also called: actual situation) aims to deduce people's willingness to pay from observed evidence in the face of real choices.

Although both RP and SP data have the strengths and weaknesses, SP data is more flexible than RP data for applying in almost any valuation context (Bradley and Daly, 1997; Morikawa, 1994; and Pearce, 2002). The SP survey has been frequently conducted because it has some great advantages which traditional RP data doesn't have. Some advantages are summarised as follows: We can treat some products which are not traded in the actual market; Collecting SP data is economical because we can collect more the one data per respondent; From the statistical viewpoint, we have some advantages, for example, more variability of attribute's levels (Sometimes a level

of service in the actual market is the same), avoidance of the correlation between the attributes (Sanko, 2001). Because of SP benefits on attributing valuation and forecasting demand, SP techniques are widely used in the filed of travel behaviour. Several evidences have found that SP studies are especially useful for studying non-existing market situations, such as improving public transport services, building new light rail line, building new motorway, and implementing road pricing (Bates, 1998; Louviere et al, 2000; Ortuzar, 2000).

The SP analysis in most SP study was based on the behavioural principle (random utility theory, RUM). The critical assumption is that decision-makers will choose the preference that yields greatest satisfaction or 'utility' Utility, U_{ni}, is postulated to be a function of both observable (or deterministic) utility and unobservable (or random) utility. Specifically:

$$U_{ni} = V_{ni} + \varepsilon_{ni}$$

Where V_{ni} is the deterministic utility derived from alternative *i* by decision-maker *n*, and ε_{ni} is the associated random utility (upala, 2007). Recently, the discrete choice models could be developed from the error components and the design of response measurement as follows:

- Binary Choice Model;
- Bivariate and Multivariate Binary Choice Model;
- Ordered Choice Model;
- Multinomial Logit Model;
- Conditional Logit Model;
- Error Components Logit Model;
- Heteroscedastic Extreme Value Model;
- Nested and Generalized Nested Logit Models;
- Random Parameters Logit Models;
- Latent Class Logit Models
- Multinomial Probit Model

The results of discrete choice estimation provide the following outputs:

- Coefficient estimates
- t-statistics and standard errors
- Log-Likelihood measures
- Rho Squared (ρ^2) goodness of fit.
- Matrix of correlations of estimated coefficients

These results can be estimated using available computer software programmes, for example ALOGIT (Hague Consulting Group, 2000) and LIMDEP (Econometric Software, 1999). As parameters estimated have associated standard errors, each parameter is considered to be significantly different from zero at the 95% confidence level when its corresponding t-ratio (the ratio of the mean parameter to its standard error) has an absolute value

greater than 1.96. The overall model goodness-of-fit is indicated by likelihood-ratio index, ρ^2, which is analogous to the R^2 for a linear regression model. The ρ^2 values between 0.2 and 0.4 are considered to indicate an extremely good fit (Louviere et al, 2000). For SP studies, the values around 0.1 are typical.

Attribute valuation can be determined directly after the model calibration. Unless otherwise specified, the choice models is based on linear-in-parameters formulation of the utility functions; this appears adequate for the purpose of this research. This form can be written as follows:

$$V_{ni} = \beta_{money} \cdot X_{moneyni} + \sum_{k} \beta_k \cdot X_{nik}$$

Where the X_{nik} are observations relating to the k^{th} variable (or 'attribute') of decision-maker *n* and alternative *i*, and the β_k are associated parameters to be estimated. Whilst $X_{moneyni}$ are observations related to the monetary attribute of decision-maker n and alternative *i*, and the β_{money} are associated money parameters.

Under general conditions, any function can be estimated arbitrarily by the linear-in-parameters form. A further attraction of the linear-in-parameters functional form is that by taking ratios of parameter estimates to the estimate of a monetary parameter, one can readily infer the marginal rate of substitution with respect to monetary (cost), or in other words 'value'. The form of marginal willingness-to-pay or value for any one of the option attributes can be written as follows:

Marginal willingness to pay $(MWTP) = \dfrac{\beta_k}{\beta_{money}}$

Where β_{money} is the coefficient on monetary and β_{money} is the coefficient on observe attribute k.

For the SP design process could be summarised in 11 steps include: (1) Initial research; (2) Experimental design; (3) Questionnaire design; (4) Testing the questionnaire; (5) Conduct the main survey; (6) Choice of population and sample; (7) Choice of survey method; (8) Discrete choice analysis and valuation techniques; (9) Use characteristics and behavioural analysis; (10) validity and reliability testing; and (11) Conclusions and reporting. Details of SP design process summarised in Figure 1.

In conclusion, SP choice or preference data come in many flavours in marketing, transport, resource economics and other social sciences within the reasons as follows (Louviere et al, 2000):

- cross-section observations of past, present or future preference or choices, including most recent or last choice;
- observations of preference or choices in controlled experiments;
- longitudinal observation of choice from scanner or other panels;
- judgments (more generally, 'evaluations') or alternatives on latent dimensions like 'attractiveness', 'purchase intent', etc., measured magnitude estimation/production; and
- observations of decisions made by single persons or groups of people; and so forth."

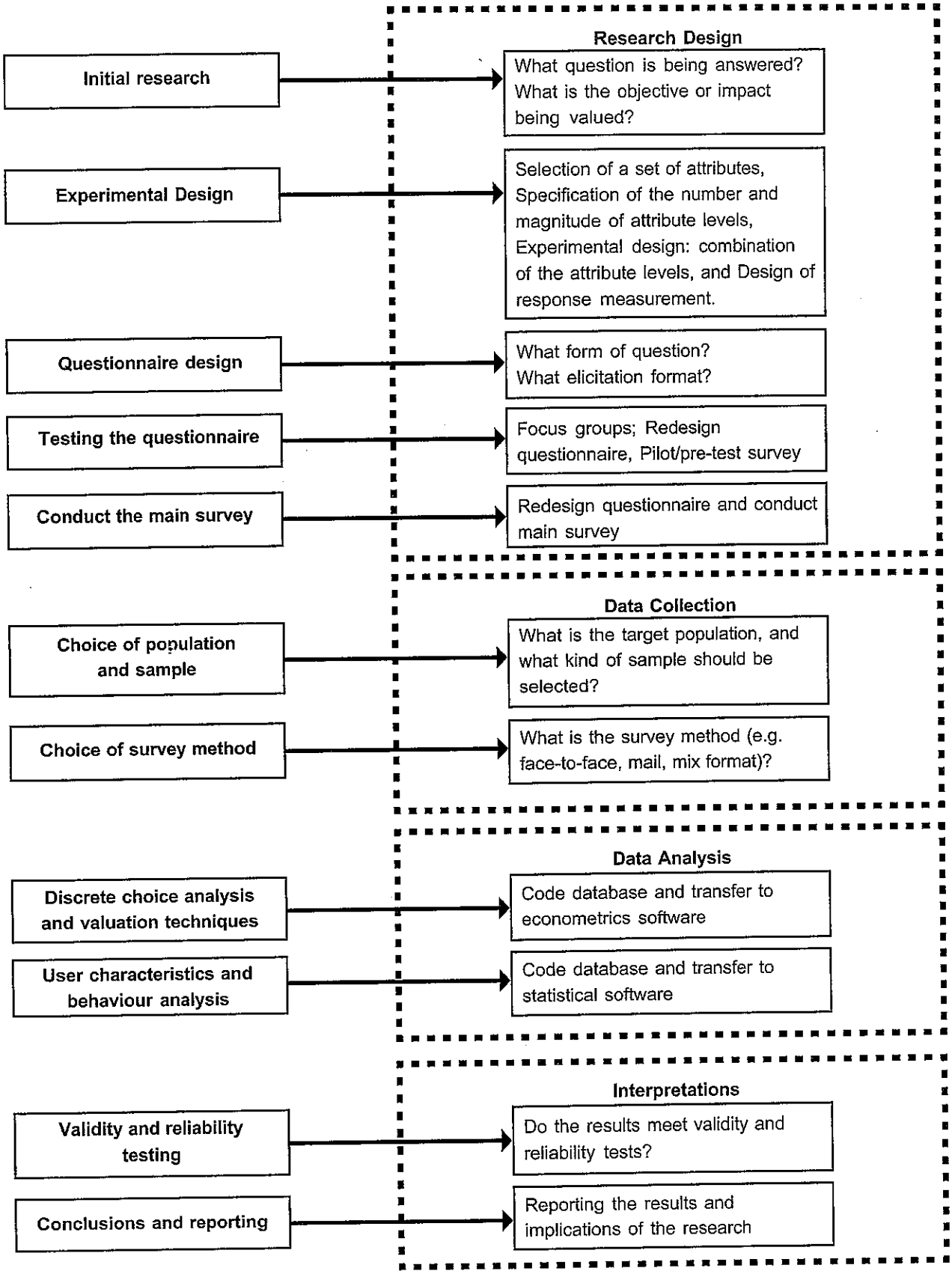

Figure 1 Process of SP techniques

4. Challenges of the SP Applications for PPP Projects

In the case of Thailand, even though there have been a relatively high number of infrastructure projects completed through PPPs, and there has been a loose legal framework in place for PPPs since 1992, the actual implementations and degrees of success of the projects have varies widely. The regulatory and legal framework surrounding PPPs for infrastructure delivery is incomplete, outdated, and fragmented (Valentine, 2008). According with Susangarn's research in 2007, the issues and challenges of PPP Project in Thailand could be divided into 5 issues, including

(1) Unclear Governing Framework - the law of Thailand is not based on PPP principle of sharing burden between public and private sectors but focusing on granting rights to operate or make use of state assets limits its usefulness.

(2) Fragmentated Authorities - there are multiple and dispersed authorities involved the current institutional setup, approval, and implementation process which could be time-consuming process.

(3) Time Consuming Procedure - time and resource spent on getting project approved and private participant selected discourage many of potential PPP projects.

(4) Insufficient Institutional Support - the absence of a central agency that has institutional knowledge similar to those of more advanced countries to provide the necessary support, including documentation, bidding methodology and evaluation, contract formulation and negotiation.

(5) Lack of Rules and Capacity with respect to Risk Allocation - the capacity of identifying, allocating and mitigating risks between public and private sectors are needs to be improved.

In the further study, we could be used in applications of the SP techniques for PPP projects in developing countries. These challenge issues include:

4.1 SP study definition

SP choice study could be applied for PPP projects towards, new product or infrastructure design; market share, profitability or margin optimisation; market strategy development (product ad channel); contractual format (service contracts, management contracts, lease contracts, build-operation-transfer (BOT) and similar arrangements, concessions; and Joint ventures), especially PPP projects of road sector in road component and type of facilities include:

- New network and structure (Highways, Tollways, Expressway, Motorway, Bridge, Tunnel, Culverts, Retaining walls);
- Signage and marking (Traffic sign, Electronic Traffic sign, Electronic Information System, and etc.);
- Electrical system, (Street lighting, Traffic lighting, and etc.); and
- Edge Treatments (Curbs, Sidewalks, Landscaping, Drainage, ad etc.)

4.2 SP experiment design for PPP projects

Design of the SP hypothetical scenarios is based on an experimental design. The critical issues are how to know suitable number of attributes, number of attribute levels and number of scenarios presented to each respondent, and how to design realistic scenarios. In Europe, some studies used six or seven attributes per alternative. In developing countries, we recommend that number of attribute should be limited at four per alternative; otherwise individuals may ignore some attributes.

(1) Selection of a set of attributes.

Attributes, which influence users' preferences, representing the characteristics of the hypothetical scenarios. The SP study could select attributes from a preliminary survey (e.g. pilot survey or focus group) and a literature review of previous studies, and factors that are the interested researchers. For PPP project, we could be applied the attributes as follows:

- Economic data (inflation, tax level, etc);
- Construction data (construction cost and investments, etc);
- Ongoing capital expenditure (both maintenance and growth related);
- Funding levels and types (equity, credits, bonds, subsidies, etc);
- Financial data (such as the terms of the financing instrument); and
- Operational data (operation cost, demand forecasts, toll rate, transfer prices, etc).

(2) Specification of the number and magnitude of attribute levels.

If there are too many attributes in a SP exercise, individuals may ignore some attributes to simplify the task. This examination is described in Fowkes and Wardman (1988), Pearmain and Kroes (1990), and Bates (1998). Pearmain and Kroes (1990) suggested that SP exercise attributes should be limited at six or seven per alternative and should be the least if it included unfamiliar variables. Furthermore, variations of attribute values across scenarios needed to be large enough for respondents to trade-off otherwise they might be ignored.

(3) Experimental design: combination of the attribute levels.

An experimental design is usually fractional factorial rather than complete (full) factorial. A complete factorial design contains all possible combinations of attribute levels. Nonetheless, a great advantage of the fractional factorial design is that the number of scenarios can be dramatically reduced from the full factorial design, while it still ensures that the main effects of attributes are independent from the significant interaction effects, so that the main effects can be estimated efficiently. Generally, the SP design is use a full factorial design. However, there are too many scenarios and game. So we need to combine some of the existing methods to solve this problem, for example, Fractional Factorial Design, Removing Trivial Games, Contextual Constraints, Block Design, Common Attributes over a Series of Experiments, Defining Attributes in Terms of Differences between Alternatives, Showing One Design Differently, Random Selection, Ratio Estimates, 'Magic' Choice Probabilities. (Sanko, 2001)

(4) Design of response measurement.

SP Questionnaire asks respondents to state their preferences towards each scenario by ranking, rating, or choice. These responses are able to provide information on how individuals evaluate the attributes in the designed scenarios. A ranking response requires respondents to order preferences of the hypothetical options presented. It is some issues dealing with respondents face in real life (Pearmain and Kroes, 1990) and reliability (Ortuzar and Garrido, 1991). A rating response requires respondents to express their degree of preference on a scale (e.g. 5, 10 or 100 point scale). This provides the richest form of data. However, a binary choice response is the most realistic and simplest in making decision, the simplest in data analysis and use for prediction, and the most widely used in SP studies. It requires respondents to choose the best one out of two or more options.

4.3 Measurement of attributes (variables) for PPP projects

Some attributes are not easy to be understood by respondents, and not easy to ask respondents to quantify them. These attributes are for example travel time, delayed time, walking time, waiting time, reliability, headway, and frequency. Moreover, it is also not easy for respondents in developing countries to understand relative value, e.g. travel time reduction 30% compared to current travel time.

4.4 Data collection method for PPP projects

In Europe, SP questionnaires are often conducted by mail-back method, or sometimes by telephone. These methods are cheaper than interview. If these methods were used in developing countries, respondents may not be able to provide reliable data. However, if interview method is used, survey staffs need to be well trained. Moreover, stating preferences towards each scenario by choice is likely to be more appropriate than rating or ranking.

4.5 Understanding of new scenarios for PPP projects

We must make sure that non-existing situations are well design to present to respondents; for example, new modes (e.g. BRT), new routes (e.g. motorways), new policies (e.g. road pricing) and service improvement (e.g. increasing reliability). Some descriptions and/or pictures are useful. If respondents miss-understand choices, their stated behaviour would be unreliable. A good application could be shown in the work of Yin-Yen et al (2008).

4.6 Captive Sample and Stakeholder for PPP projects

Some respondents may not consider any alternatives presented to them. They are captive to what they have done or chosen before. They do not trade-off among attributes. These respondents are those who have no choice, those who have personal and family constraints, and those who do not want to change their behaviours (habit). In developing countries, number of captive respondents is high and very likely to higher than in developed countries. If captive proportion is not considered in the model, predicted results may be wrong. However, the PPP project would be applies in the stakeholders who have the key for successful, such as political decision makers who have establish and prioritize goals and objectives of PPP and communicate these to the public; company management and staff who identify company-specific needs and goals of PPP and assist in marketing and due diligence process; consumers who communicate ability and willingness to pay for service; investors who provide feedback on attractiveness of various PPP options; strategic consultants who provide unbiased evaluation of option for PPP.

4.7 Current situations in developing countries for PPP projects

Current situations in developing countries are much different from developed countries, e.g. lifestyles of living, infrastructure and road transport service. This is likely to affect respondents' behaviours. To consideration for situations in developing countries, the five PPP project issues include unclear governing framework, fragmented authorities, time consuming procedure, insufficient institutional support, and lack of rules and capacity with respect to risk allocation.

Acknowledgements

The author would like to thank Associate Professor Dr. Sorawit Narupiti from Chulalongkorn University, Thailand for having introduced me to understand Public-Private Partnership (PPP) approach.

References

[1] Asian Development Bank. (2008) **Public-Private Partnership (PPP) Handbook.** Available at http://www.adb.org/Documents/Handbooks/Public-Private-Partnership/default.asp

[2] Bates, J. (1998) **Reflections on Stated Preference: Theory and Practice.** In Ortuzar, J.D, Hensher, D.A and Jara-Diaz, S. (eds.), Travel behaviour research: Updating the state of play, Amsterdam: Elsevier, pp. 88-103.

[3] Bradley, M.A. and Daly, A.J. (2000) New analysis issues in stated preference research, **Stated Preference Modelling Techniques.** In Ortuzar, J. (ed). PTRC: London, pp 37-52.

[4] Bradley, M.A. and E.P. Kroes. **Forecasting Issues in Stated Preference Survey Research,** In E.S. Ampt, A.J. Richardson and A.H. Meyburg (eds.), Selected Readings in Transport Survey Methodology, Eucalyptus Press, AUS, 1992.

[5] Econometric Software. **LIMDEP 7.0 for Windows,** Econometric Software Inc., New York, 1999.

[6] Fowkes, A.S and Wardman, M. (1988), **Design of Stated Preference Travel Choice Experiments with Special Preference to Taste Variation,** Journal of Transport Economics and Policy, Vol. 22(1), pp. 27-44.

[7] Hague Consulting Group. **ALOGIT Users' Guide: Version 3.8,** Netherlands, 1995.

[8] Louviere, J., Hensher A. D, Swait D. J. (2000) **Stated Choice Methods Analysis and Applications,** Cambridge University Press: Cambridge.

[9] Morikawa, T. (1994) **Correcting Stated Dependence and Serial Correlation in RP/SP Combined Estimation Method,** Transportation, 21 no.2, pp. 153-165.

[10] Ortuzar, J. de D. and R.A. Garrido. **Rank, Rate or Choice? An Evaluation of SP Methods in Santiago.** Proceedings of 19th PTRC Summer Annual Meeting: Seminar G, 1991, pp.301-312.

[11] Pearce, D. and et al. (2002) **Economic Valuation with Stated Preference Techniques: Summary Guide,** Department for Transport, Local Government and the Regions: London.

[12] Pearmain, D. and Kroes, E. (1990) **Stated Preference Techniques: A Guide to Practice,** Richmond : Steer Davies & Gleave Ltd.

[13] Sanko, N. (2001). **Guideline for State Preference Experiment Design.** MBA Dissertation, Ecole Nationale des Ponts et Chauss?es, Paris.

[14] Samir, H.W.I.K (2008). **Evaluation and Public Private Partnership: Posing the Questions.** Available at http://www.unpcdc.org/media/2670/evaluation%20&%20public%20private%20partnerships.pdf

[15] Susangarn, C. (2007) **Public Private Partnership in Thailand: Past Experiences and Future Prospects.** Available at http//:www.unescap.org/ttdw/ppp/PPP2007/bf_thailand.pdf

[16] Valentine, Jon. (2008) Public-Private Partnerships in Infrastructure: Best-Practices from the **International Experience and Applications for Thailand** Available at http://www.nesdb.go.th

[17] Upala, P. (2007) Development of Stated Preference (SP) Technique for **Determining Service Quality of Paratransit.** Ph.D. Dissertation, Chulalongkorn University, 2007

[18] Wikipedia. (2009) Available at http://en.wikipedia.org/wiki/Preference and http://en.wikipedia.org/wiki/Public-private_partnership