World Academy of Science, Engineering and Technology
International Journal of Structural and Construction Engineering
Vol:12, No:06, 2018

# Price Compensation Mechanism with Unmet Demand for Public-Private Partnership Projects

**Authors :** Zhuo Feng, Ying Gao

**Abstract :** Public-private partnership (PPP), as an innovative way to provide infrastructures by the private sector, is being widely used throughout the world. Compared with the traditional mode, PPP emerges largely for merits of relieving public budget constraint and improving infrastructure supply efficiency by involving private funds. However, PPP projects are characterized by large scale, high investment, long payback period, and long concession period. These characteristics make PPP projects full of risks. One of the most important risks faced by the private sector is demand risk because many factors affect the real demand. If the real demand is far lower than the forecasting demand, the private sector will be got into big trouble because operating revenue is the main means for the private sector to recoup the investment and obtain profit. Therefore, it is important to study how the government compensates the private sector when the demand risk occurs in order to achieve Pareto-improvement. This research focuses on price compensation mechanism, an ex-post compensation mechanism, and analyzes, by mathematical modeling, the impact of price compensation mechanism on payoff of the private sector and consumer surplus for PPP toll road projects. This research first investigates whether or not price compensation mechanisms can obtain Pareto-improvement and, if so, then explores boundary conditions for this mechanism. The research results show that price compensation mechanism can realize Pareto-improvement under certain conditions. Especially, to make the price compensation mechanism accomplish Pareto-improvement, renegotiation costs of the government and the private sector should be lower than a certain threshold which is determined by marginal operating cost and distortionary cost of the tax. In addition, the compensation percentage should match with the price cut of the private investor when demand drops. This research aims to provide theoretical support for the government when determining compensation scope under the price compensation mechanism. Moreover, some policy implications can also be drawn from the analysis for better risk-sharing and sustainability of PPP projects.

**Keywords :** infrastructure, price compensation mechanism, public-private partnership, renegotiation
**Conference Title :** ICCEPM 2018 : International Conference on Construction Engineering and Project Management
**Conference Location :** Paris, France
**Conference Dates :** June 25-26, 2018