

Evolutionary game of investors' opportunistic behaviour during the operational period in PPP projects

Access to new resource related to public private partnerships added to PMWL



Resource provided by [Diana Serikbay](#)

7 April 2022 – Almaty, Kazakhstan – Access to a new resource has been added to the PM World Library (PMWL) related to Public Private Partnerships. The new resource is titled **“Agent-Based Debt Terms’ Bargaining Model to Improve Negotiation Inefficiency in PPP Projects”** and is a paper by Lei Zhu, Xianbo Zhao and D. K. H. Chua published in the Journal of Computing in Civil Engineering in March 2016.

This paper explores the development of a negotiation model that will improve the efficiency of negotiation through process modeling and negotiation by the private sector and the bank. This study uses two models. The first model is a classic game model built on time intervals. The second deals with debt and factors that affect the two players. If the rate of bank lending exceeds the rate offered by the private sector, both players will negotiate to fill the difference. These negotiations are considered by the theory of bargain. This model has a time limit, so the authors tend to believe that one of the players will be forced to concede to the other very soon. Applying game theory, the authors determine the most appropriate strategy, taking into account the characteristics of the negotiations. There are two players involved in the negotiations: the bank and the sponsor.

There are two risks to consider: a) the players do not want to give up their advantage; b) the advantage disappears with an external choice. Both sides are focused on making a profit, at the same time they are afraid that the negotiations may break down and they will miss any opportunity to make at least some profit. The sponsor is limited in the selection and search of banks due to time. The bank has a limit on the number of such projects.

The results of this game showed that the greater the strength of the negotiations, the higher the return and the duration of the negotiations is much shorter. The sponsor has a slightly higher market power than the bank. The authors developed a model in which negotiation tactics were used, taking into account the time and approaches for learning.

The results of the study showed that when using negotiation tactics, there are 4 outcomes for each situation:

- 1) Whoever starts negotiations first has more chances and has superiority over the other
- 2) Having the superiority of the first one who started the negotiations, there is a chance to complete the negotiations faster.
- 3) There can also be a compromise
- 4) The sponsor sometimes donates in order to complete negotiations successfully.

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For PMWL Post

Zhu, L., Zhao, X. and Chua, D. K. H. (2016): **Agent-Based Debt Terms' Bargaining Model to Improve Negotiation Inefficiency in PPP Projects**, Journal of Computing in Civil Engineering, March. Available online at https://www.researchgate.net/publication/296625819_Agent-Based_Debt_Terms%27_Bargaining_Model_to_Improve_Negotiation_Inefficiency_in_PPP_Projects (Serikbay)

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