

MODELLING VIABILITY GAP FUNDING AND  
RISK MITIGATION IN PUBLIC PRIVATE  
PARTNERSHIP (PPP) PROJECTS: A STUDY OF  
TOLL ROADS IN VIETNAM

by

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## GLOSSARY

ADB	Asian Development Bank
BOT	Built-operation-transfer
BT	Built-transfer
BTO	Built-transfer-operation
CAR	Cash flow-at-risk
CBA	Cost and benefit analysis
CEDA	Committee for Economic Development of Australia
DBFOT	Design-built-finance-operation-transfer
ENPV	Economic net present value
EPC	Engineering, procurement and construction
ERS	Ensured revenue stream
GDP	Gross domestic product
IBRD	International Bank of Reconstruction and Development
NPV	Net present value
O&M	Operation and maintenance
ODA	Official development aid
OMC	Operation and maintenance cost
PCU	Passenger car equivalent unit
PPP(s)	Public-private partnership(s)
TGV	Total guarantee value
TTC	Travel time cost
VG	Viability gap
VGf	Viability gap funding
VOC	Vehicle operating cost
WACC	Weighted average cost of capital



## **ABSTRACT**

Government support for public–private partnership (PPP) projects has been popular in many developed countries as a means of compensating private investors for taking on public risk. The developing countries, being suggested by the international organisations like The World Bank, ADB, are following PPP of the developed world. An investigation of how government support for PPP projects is used in developing countries is important. This thesis focuses on two major issues that government support measures aim to address: viability gap elimination and public risk mitigation of toll road projects in Vietnam. The thesis also presents a model for evaluating government support measures, to assist in government decision-making. PPP toll road sector in Vietnam has been used as a case study. A specific PPP toll road project has also been used for illustration of how to apply the developed model.

The study has applied mixed method approach in four phases: model development, questionnaire survey, semi-structured interviews and analysis of a case study. The research findings show the implications for management of risks and government supports for PPP projects in developing countries, specifically to Vietnam. It was found that twenty two types of risks experienced in toll road projects in Vietnam with eighteen of them required government supports to mitigate consequences of risks. Sixteen government support measures had also been found as effective for use in PPP toll road projects in Vietnam. The findings of the study can assist both public and private sectors, consultants and practitioners and policy makers (both domestic and international) by providing references and empirical evidences for applicable government support measures and risk mitigation for PPP toll roads projects and the projects alike in developing and developed countries.

The study also develops a model to assist government officials, private investors and consultants working on design or appraisal of government support programs to either top-up a viability gap or mitigate consequence of risks in PPP toll road projects in Vietnam. The developed model should be able to provide specific answers for decision-making process such as top-up value for a viability gap, a maximum support guarantee value for a typical type of risk at a given level of confidence. The model also can help to compare between support measures to choose an optimum support, which brings the least cost to the government but helps to gain the largest benefit to the society.

As a result, the study has a significant contribution to the practice via enhancing the efficiency of staffs involved in assessment of government support programs both in public and private sectors in Vietnam as so far there was no such model available. Besides, the model is flexible for application in the evaluation of government support in other sectors and countries; the model's inputs, such as risk factors and government support measures, as well as targeted output, can be varied to match the user's analysis purpose.

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