

Ain Shams University Faculty of Engineering

Structural Department

Modeling system to support the determination of the Return on Investment (ROI) and mitigation tools for PPP projects

By

Hossam El-Din Mohamed Bahaa

A Thesis Submitted to the

Faculty of Engineering at Ain Shams University
in Partial Fulfillment of
Requirements for the degree of
DOCTOR OF PHILOSOPHY

in

Structural Engineering
Construction Project Management
Faculty of Engineering, Ain Shams University
Cairo, Egypt
2018

Modeling system to support the determination of the Return on Investment (ROI) and mitigation tools for PPP projects

By

Hossam El-Din Mohamed Bahaa

A Thesis Submitted to the
Faculty of Engineering at Ain Shams University
in Partial Fulfillment of
Requirements for the degree of
DOCTOR OF PHILOSOPHY

Structural Engineering
Construction Project Management

Under the Supervision of

Dr. Ibrahim Abdel Rashid Nosair
Professor
Structural Engineering
Department
Faculty of Engineering
Ain Shams University

Dr.:Ayman Hussien Hosny
Professor
Structural Engineering
Department
Faculty of Engineering
Ain Shams University

Dr. Mohamed Ahmed El-Mikawi

Associate Professor
Structural Engineering Department
Faculty of Engineering
Ain Shams University
Faculty of Engineering, Ain Shams University
Cairo, Egypt
2018

STATEMENT

This thesis is submitted to Ain Shams University, Cairo, Egypt, on 2018 for the degree of doctor of philosophy in Civil Engineering (Structural).

The work included in this thesis was carried out by the author in the Department of Structural Engineering, Ain Shams University

No part of this thesis has been submitted for a degree or qualification at any other University or Institute.

Date: / / 2018

Signature:

Name: Hossam El-Din Mohamed Bahaa

ACKNOWLEDGMENT

First and foremost, thanks to my Allah (God) for giving me the health and wealth needed to accomplish this goal. My heartfelt thanks and appreciation goes to all those who assisted and encouraged me and/or contributed directly or indirectly to the success of this research. The success of this research would not have been possible without your input.

Thanks to my supervisors, Professor Dr. Ibrahim Abel Rashid, Professor Dr. Ayman Hussien, for their continued support, inspiration, and insightful advice during my research work. I would like to extend my gratitude to Dr. Mohamed El-Mikawi for assisting me with his most valuable, practical and academic knowledge.

Many thanks to the Examiners Committee' members Prof. Dr. Sami Freig and Prof. Dr. Adel AlSamadony for reading my thesis and providing constructive criticism.

My sincerest appreciation goes to all involved public, private sectors' participants and agencies for their valuable time and participation in this dissertation. Thanks to all my colleagues at work for their moral support and encouragement, all the respondents during the data gathering stage.

I say thank you very much.

DEDICATION

This thesis is dedicated:

To my lovely wife Eman, for her emotional support and continuous encouragement along the way my study would not be possible without her support and patience. Her unconditional love and incredible support, have helped me achieve one of my life-long goals.

To my late father who taught me the value of education and knowledge.

To my mother who blessed my life with her affection, love and praise.

To my daughters Aya, Areej and Anoureen, for their smiles and cuddles that always gave me the motivation to work hard for the sake of their future.

STATEMENT	I
ACKNOLEGMENT	II
DEDICATION	III
TABLE OF CONTENTS	V
LIST OF FIGURES	XX
LIST OF TABLES	XXI
LIST OF ABBREVIATIONS	XXIII
ABSTRACT	XXV

TABLE OF CONTENTS

Chapter 1	INTRODUCTION	1
1.1 OV	VERVIEW	2
1.2 BA	ACKGROUND	2
1.3 PR	ROBLEM DEFINITION	3
1.4 RE	ESEARCH OBJECTIVES	3
1.5 RE	ESEARCH METHODOLOGY	4
1.5.1	Methodology Approaches	4
1.5.1	1.1 Quantitative Technique	4
1.5.1	1.2 Qualitative Technique	5
1.5.2	1.3 Case Study	5
1.6 TH	HE RESEARCH LIMITATIONS	5
1.7 TF	HE RESEARCH CONTRIBUTIONS	7
1.8 TH	HE RESEARCH STRUCTURE	7
1.9 SU	JMMARY	9
Chapter 2	LITERATURE REVIEW1	0
2.1 IN	TRODUCTION1	1
2.2 CC	OMMENCEMENT OF PPP1	1
2.2.1	The Concept of Concessions1	2
2.2.2	Definition of PPP1	2
2.2.3	Types of PPPs1	3

2.2.4	PPP Projects Importance and Needs	13
2.2.4	4.1 Attract Private Capital	14
2.2.4	4.2 Increasing Efficiency	14
2.2.4	4.3 PPP as A Motivation Tool to Sector Reform	m 15
2.2.5	Principals Roles of PPP	15
2.2.6	Common Sectors in PPP Projects	16
2.3 GL	OBAL PPP INVESTMENT	16
2.3.1	Regional PPP Investment Trends	17
2.3.2	Countries Based PPP Trends	19
2.3.2	2.1 High Rated Countries in PPP Investment	19
2.3.3	Sectors Based PPP Investment Trends	21
2.4 PP	P USED FOR BUDGETARY CONSTRAINS	22
2.4.1	The PPPs Involvement Output	24
2.5 AI	OVANTAGES AND DISADVANTAGES OF PPP	24
2.5.1	Public Sector Perspective	24
2.5.1	1.1 Advantages in Finance	25
2.5.1	1.2 Advantages in Construction	25
2.5.1	1.3 Advantages in Operation	25
2.5.1	1.4 Disadvantages in Finance	25
2.5.1	1.5 Disadvantages in Construction	25
2.5.1	1.6 Disadvantages in Operation	26
2.6 AT	OVANTAGES AND DISADVANTAGES OF PPP	26

2.6.1 Pri	vate Sector Perspective	6
2.6.1.1	Advantages in Finance2	6
2.6.1.2	Advantages in Construction2	6
2.6.1.3	Advantages in Operation20	6
2.6.1.4	Disadvantages in Finance2	7
2.6.1.5	Disadvantages in Construction2	7
2.6.1.6	Disadvantages in Operation2	7
2.7 TYPES	OF PPP CONTRACTS2	7
2.7.1 Sea	rvice Contracts2	7
2.7.2 Ma	anagement and Operation Contracts23	8
2.7.3 Le	asing Contracts23	8
2.7.4 Co	ncession Contracts2	9
	Build Operate Transfer projects (BOT	
2.7.4.2	Build Operate Own Transfer (BOOT)3	0
2.7.4.3	Build Own Operate (BOO)3	1
2.7.4.4	Build Lease Operate Transfer (BLOT)3	1
2.7.4.5	Build Lease Transfer (BLT)	1
2.7.4.6	Design Build Finance Operate (DBFO)3	1
2.7.4.7	Modernize Own Operate Transfer (MOOT) 32	2
2.7.4.8	Rehabilitate Own Operate (ROO)32	2
2.7.4.9	Buy Build Operate (BBO)32	2
2.7.4.10	Build Transfer Operate (BTO)3	2