



THE ECONOMIC PERFORMANCE  
OF PUBLIC INVESTMENTS:

**An Ex Post Evaluation  
of Water Resources Investments**

Robert H. Haveman

Published for Resources for the Future, Inc.

By The Johns Hopkins Press, Baltimore and London

# CONTENTS

<i>Foreword</i> .....	xi
<i>Preface</i> .....	xiii
<i>Chapter I. The Ex Post Evaluation of Public Investments</i> .....	1
Ex Ante and Ex Post Evaluation of Government Programs:	
The Setting	2
Obstacles to Ex Post Investment Evaluation	6
A Note on Prices and the Evaluation of Public Investments	9
The Contents of This Study	12
<i>Chapter II. The Ex Post Evaluation of Flood Control Investments</i> .....	14
The Outputs of Flood Control Projects	15
The Reduction of Crop Damage from Flooding	15
The Reduction of Property Damage from Flooding	16
The Reduction of Indirect Production Losses from Flooding	17
Improvements in Productivity of Land and Property on the Floodplain	19
Approaches to Ex Post Efficiency Appraisal	19
The Direct Measurement Procedure	19
Comparative Land Values as Evaluators of Efficiency Performance	22
The John H. Kerr Reservoir—A Case Study in Ex Post Evaluation	23
Ex Ante and Ex Post Estimates of Flood Damage	25
Ex Ante and Ex Post Estimates of Flood Control Benefits	32
Ex Post Economic Benefits versus Actual Damages Averted	33
Conclusions	37
<i>Chapter III. The Ex Post Evaluation of Navigation Improvements</i> .....	38
National Resource Savings from Waterway Development	38
The Components of Navigation Benefits and Their Ex Ante Measurement	42
The Current Practice of Ex Ante Navigation Benefit Estimation	45
Current Waterway Evaluation Practice—A Case in Point	51
The Estimation of Base-Year Potential Waterway Traffic	51
The Estimation of Savings to Shippers	52
Projection of Future Traffic	53

Future Savings to Shippers	54
A Case Study in Ex Post Evaluation: The Illinois Waterway	54
Suggestions for Further Ex Post Analysis	64
<i>Chapter IV. The Ex Post Evaluation of Hydroelectric Projects</i> .....	66
Ex Post Analysis and Energy Output Estimation	66
Monitoring and Improved Ex Ante Benefit Estimation	83
Length of Life of Steam Generating Plants	85
Productivity Change in Electrical Generation by Steam Facilities	86
Plant Factor Reduction of Steam Facilities	88
Technological Change and the Estimation of Public Hydropower Benefits	89
Conclusions	92
<i>Chapter V. The Ex Post Evaluation of Project Cost Estimates</i> .....	93
Previous Ex Post Cost Studies	94
The Corps of Engineers Study, 1951	94
The Corps of Engineers Study, 1964	95
The Bureau of Reclamation Study, 1951	96
The Bureau of Reclamation Study, 1955	96
The Bureau of Reclamation Study, 1960	97
An Analysis of Recent Corps of Engineers Cost Estimation Performance	97
The Method of the Study and the Data	98
Ex Ante and Realized Costs: Current Dollars	99
Ex Ante and Realized Costs: Constant (1955) Dollars	101
Some Summary Statistics	104
Summary and Conclusions	107
<i>Epilogue</i> .....	110
<i>Appendix A. The Use of Land Values in the Ex Post Evaluation of Benefits of Flood Protection Investments</i> .....	113
<i>Appendix B. The 1964 Revision of Waterway Evaluation Procedures, by William Proxmire</i> .....	115
<i>Appendix C. List of Projects Studied in Chapter 5, by Category</i> .....	119
<i>Index</i> .....	122