

SECOND EDITION

Public Finance

A Normative Theory

Richard W. Tresch

"This volume offers a detailed introduction to theoretical work on many of the core issues in contemporary public economics. Careful and comprehensive, it will provide readers with an ideal springboard to further research."

—JAMES M. POTERBA
Mitsui Professor of Economics
Massachusetts Institute of Technology



Second Edition

PUBLIC FINANCE

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Richard W. Tresch

*Department of Economics
Boston College
Chestnut Hill, Massachusetts*



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CONTENTS

PREFACE xxi

I INTRODUCTION: THE CONTENT AND METHODOLOGY OF PUBLIC SECTOR THEORY

I Introduction to Normative Public Sector Theory

- The Fundamental Normative Questions 5
- Government Expenditure Theory: Philosophical
Underpinnings 7
 - Humanism, Consumer Sovereignty, Capitalism, and the
Government* 7
 - The Legitimate Functions of Government* 8
 - The Goals of Government Policy* 9
 - The Government as Agent* 12

Government Expenditure Theory and Market Failure	14
<i>The Fundamental Theorems of Welfare Economics</i>	14
<i>The Distribution of Income</i>	15
<i>The Allocation of Resources</i>	17
<i>Private or Asymmetric Information</i>	17
The Government Sector in the United States	20
The Theory of Taxation	23
Fiscal Federalism	25
The Theory of Public Choice	26
Summary	29
References	31

2 A General Equilibrium Model for Public Sector Analysis

A Baseline General Equilibrium Model	34
<i>Individual Preferences</i>	35
<i>Production Technologies</i>	36
<i>Market Clearance in the Aggregate</i>	37
Efficiency: The Pareto-Optimal Conditions	37
Equity: The Social Welfare Function and Optimal Distribution of Income	39
<i>The Bergson–Samuelson Social Welfare Function</i>	40
<i>Limitations of the Social Welfare Function</i>	43
Maximizing Social Welfare	45
<i>Necessary Conditions for Social Welfare Maximization</i>	46
<i>The First-Best Efficiency–Equity Dichotomy</i>	46
<i>The Pareto-Optimal Conditions</i>	48
<i>Pareto Optimality and Perfect Competition</i>	55
<i>The Interpersonal Equity Conditions</i>	56
Policy Implications and Conclusions	62
References	64

3 First-Best and Second-Best Analysis and the Political Economy of Public Sector Economics

Lump-Sum Redistributions and Public Sector Theory	66
First-Best Analysis	67
<i>The Two Dichotomies in First-Best Models</i>	67

Second-Best Analysis	71
<i>Constrained Social Welfare Maximization</i>	71
<i>The Most Common Policy and Market Constraints</i>	74
<i>Further Implications of Second-Best Modeling</i>	76
Similarities Between First-Best and Second-Best Analysis	79
The Political Economy of the Social Welfare Function	81
<i>The Form of the Social Welfare Function: From Utilitarian to Rawlsian</i>	81
<i>A Flexible Social Welfare Function</i>	85
<i>Arrow's Impossibility Theorem</i>	86
<i>The Gibbard–Satterthwaite Theorem</i>	92
<i>Reactions to the Arrow and Gibbard–Satterthwaite Theorems</i>	95
Conclusion	96
References	98

II THE THEORY OF PUBLIC EXPENDITURES AND TAXATION—FIRST-BEST ANALYSIS

4 The Social Welfare Function in Policy Analysis

Social Welfare and the Distribution of Income: The Atkinson Framework	104
<i>The Atkinson Assumptions</i>	105
<i>The Bias Toward Equality</i>	106
<i>Okun's Leaky Bucket</i>	108
<i>The Atkinson Social Welfare Function</i>	109
<i>Social Welfare Indexes of Inequality</i>	112
<i>Atkinson's Index in Inequality</i>	116
<i>Inequality versus Social Welfare: Sen's Critique</i>	117
<i>The Atkinson Framework and Inequality in the United States</i>	118
Social Welfare and Consumption: The Jorgenson Analysis	119
<i>The Estimating Share Equations</i>	119
<i>Social Welfare</i>	123
<i>Income Measures of Social Gain and Loss</i>	124
<i>Jorgenson's Social Expenditure Function</i>	128
<i>Social HCV and HEV</i>	131
<i>Two Applications for the U.S. Economy</i>	131
Social Welfare and Social Mobility	134
<i>Social Mobility and the Distribution of Income</i>	135

Structural Mobility, Circulation Mobility, and Social Welfare 137

Social Mobility in the United States 143

References 143

5 The Problem of Externalities—An Overview

Policy-Relevant Externalities 145

The Terminology of Externalities 147

The Analysis of Externalities: Modeling Preliminaries 148

The Interpersonal Equity Conditions 151

The Pareto-Optimal Conditions 151

References 152

6 Consumption Externalities

How Bad Can Externalities Be? 154

The Worst of All Worlds—All Goods (Factors) are Pure Public Goods (Factors) 157

Interpersonal Equity Conditions 158

Pareto-Optimal Conditions 158

The Existence of at Least One Pure Private Good 159

Interpersonal Equity Conditions 160

Pareto-Optimal Conditions 160

Externalities as Market Failure: The Missing Side Markets 163

Bargaining and the Coase Theorem 166

The Tax/Subsidy Solution 167

Limited Externalities 169

Nonexclusive Goods—The Samuelson Model 170

The Government in a General Equilibrium Model 172

Allocating a Nonexclusive Good 173

The First-Best Dichotomy: The Private Goods and Factors 175

Policy Problems with Nonexclusive Goods 176

Paying for the Public Good 178

The Benefits-Received Principle of Taxation 179

Preference Revelation and Taxation: The Mechanism Design Problem 184

Do People Free Ride? 187

Aggregate Externalities 193

<i>The Pigovian Tax</i>	194
<i>Finding the Optimum by Trial and Error</i>	198
<i>Two Caveats to the Pigovian Tax</i>	200
References	202

7 Production Externalities

The Condensed Model for Production Externalities	206
Aggregate Production Externalities	208
<i>The First-Order Conditions—Pareto Optimality</i>	210
<i>The Pigovian Tax</i>	212
<i>Three Geometric Interpretations of the Pareto-Optimal Conditions</i>	214
<i>Internalizing the Externality</i>	217
<i>Additional Policy Considerations</i>	219
Concluding Comments: The Problem of Nonconvex Production Possibilities	229
References	231

8 The U.S. Antipollution Policies: An Application of Externality Theory

Preliminary Theoretical Considerations in Analyzing Pollution	234
<i>Consumption–Production Externalities</i>	235
<i>Legislating Pollution Standards</i>	239
U.S. Antipollution Policies	245
<i>The CAC Approach to Industrial Water and Air Pollution</i>	245
<i>Automobile Emissions Control Equipment</i>	247
<i>Marketable Permits for SO₂ Emissions</i>	248
Municipal Waste-Treatment Facilities and the Superfund:	
Defensive Antipollution Strategies	253
<i>Equilizing Marginal Costs in Reducing Pollution</i>	257
<i>Additional Complicating Issues</i>	258
<i>Municipal Waste-Treatment Plants and Superfunds</i>	260
Concluding Comments	260
References	261
Appendix: History of U.S. Antipollution Legislation	262
<i>Municipal Waste Treatment</i>	262

<i>Automobile Emissions</i>	263
<i>Industrial Air Pollution</i>	263
<i>Industrial Water Pollution</i>	266
<i>Toxic Substances</i>	267
<i>The Effectiveness of U.S. Antipollution Policies</i>	269

9 The Theory of Decreasing Cost Production

Decreasing Cost in General Equilibrium Analysis	273
<i>The Pareto-Optimal Conditions</i>	275
<i>Decreasing Cost and Competitive Markets</i>	276
<i>The Optimal Pricing Rule</i>	278
<i>The Optimal Investment Rules</i>	280
<i>Decreasing Cost Services and Public Goods</i>	295
Reflections on U.S. Policy Regarding Decreasing Cost Services:	
The Public Interest in Equity and Efficiency	297
<i>Equity Considerations</i>	299
<i>Efficiency Considerations</i>	302
References	304
Appendix: Returns to Scale, Homogeneity, and Decreasing Cost	304

10 The First-Best Theory of Taxation

Public Choice and Pareto-Optimal Redistribution	309
<i>Pareto Optimality and the Overall Distribution of Income</i>	311
<i>Pareto-Optimal Redistribution and the Poor</i>	313
<i>What Motivates Charity: Should Aid Be In-Kind or Cash?</i>	315
<i>Are Pareto-Optimal Redistributions Enough?</i>	320
Altruism, Free Riding, and Crowding Out of Private Charity	322
<i>Do People Free Ride?</i>	322
<i>Does Public Assistance Crowd Out Private Giving?</i>	324
Other Motivations for Redistributive Transfers	326
<i>Public Insurance</i>	326
<i>Social Status</i>	327
<i>Equal Access</i>	328
References	328

II Applying First-Best Principles of Taxation—What to Tax and How

Designing Broad-Based Taxes: The Economic Objectives	332
Ability to Pay: Theoretical Considerations	334
<i>Two Preliminary Considerations</i>	335
Horizontal Equity	337
<i>From Horizontal Equity to the Ideal Tax Base</i>	337
<i>Haig–Simons Income</i>	338
<i>Criticisms of Haig–Simons Income</i>	341
<i>Haig–Simons Income Versus Expenditures: Musgrave’s Perspective</i>	348
<i>Horizontal Equity and the Interpersonal Equity Conditions</i>	349
Vertical Equity	352
<i>Progressive, Proportional, and Regressive Taxes</i>	352
<i>Vertical Equity and the Interpersonal Equity Conditions</i>	353
<i>Sacrifice Principles of Vertical Equity</i>	354
<i>Young’s Prescription for Vertical Equity</i>	356
<i>Vertical Equity in the United States</i>	361
Reflections on the Haig–Simons Criterion in Practice: The Federal Personal Income Tax	362
<i>Personal Income</i>	362
<i>Capital Gains</i>	363
<i>The Taxation of Personal Income: The Tax Loopholes</i>	364
<i>The Taxation of Capital Gains: Inflation Bias and Realization</i>	370
The Inflationary Bias Against Income from Capital	370
Taxing Realized Gains: Auerbach’s Retrospective Taxation Proposal	373
<i>Capital Gains Taxation: A Postscript</i>	378
<i>The Taxation of Human Capital</i>	378
Summary	382
References	382

III THE THEORY OF PUBLIC EXPENDITURES AND TAXATION: SECOND-BEST ANALYSIS

12 Introduction to Second-Best Analysis

- A Brief History of Second-Best Theory 390
 - Second-Best Tax Theory* 391
 - Second-Best Expenditure Theory* 391
 - Private Information* 393
- Philosophical and Methodological Underpinnings 396
- Preview of Part III 397
- References 398

13 The Second-Best Theory of Taxation in One-Consumer Economies with Linear Production Technology

- General Equilibrium Price Models 401
- The Measurement of Loss from Distorting Taxes 402
 - The Geometry of Loss Measurement: Partial Equilibrium Analysis* 403
 - The Geometry of Loss Measurement: General Equilibrium Analysis* 404
 - The Analytics of General Equilibrium Loss Measurement* 409
 - Policy Implications of the Loss Measures* 417
- The Optimal Pattern of Commodity Taxes 429
 - Policy Implications of the Optimal Tax Rule* 432
- Substitutions Among Taxes: Implications for Welfare Loss 439
 - The Corlett and Hague Analysis* 441
- References 444

14 The Second-Best Theory of Taxation with General Production Technologies and Many Consumers

- A One-Consumer Economy with General Technology 448
 - Dead-Weight Loss from Taxation* 448

<i>Optimal Commodity Taxation</i>	458
Many-Person Economies: Fixed Producer Prices	461
<i>Social Welfare Maximization Versus Loss</i>	
<i>Minimization</i>	461
<i>Optimal Commodity Taxation in a Many-Person</i>	
<i>Economy</i>	465
<i>U.S. Commodity Taxes: How Far From Optimal?</i>	472
Many-Person Economy with General Technology	474
<i>Optimal Taxation</i>	477
The Social Welfare Implications of any Given Change in	
Taxes	478
References	482

15 Taxation Under Asymmetric Information

Lump-Sum Redistributions and Private Information	487
Redistribution Through Commodity Taxation	489
Optimal Taxation, Private Information, and Self-Selection	
Constraints	493
<i>Elements of the Model</i>	494
<i>Pareto-Efficient Taxation</i>	497
<i>An Extension: The Direct-Indirect Tax Mix</i>	502
Optimal Income Taxation	503
<i>The Shape of the Tax Schedule</i>	508
<i>Concluding Observations</i>	511
Tax Evasion	512
<i>Increasing the Penalty</i>	515
<i>Increasing Monitoring</i>	515
<i>Revenue-Raising Strategies</i>	516
<i>Tax Amnesties</i>	519
Concluding Remarks	519
References	521

16 The Theory and Measurement of Tax Incidence

Tax Incidence: A Partial Equilibrium Analysis	524
First-Best Theory, Second-Best Theory, and Tax Incidence	525
Methodological Differences in the Measurement of Tax	
Incidence	527
Theoretical Measures of Tax Incidence	528
<i>General Principles of Tax Incidence</i>	530

<i>The Disposition of the Tax Revenues</i>	530
<i>Welfare Measures of Tax Incidence: One-Consumer Economy</i>	534
<i>The Relative Price Measure of Differential Tax Incidence: One-Consumer Economy</i>	537
The Equivalence of General Taxes	540
<i>Theorem: The Equivalence of General Taxes</i>	541
Measuring Tax Incidence: A Many-Consumer Economy	546
<i>The Individual Perspective on Incidence</i>	546
<i>The Aggregate Social Welfare Perspective on Incidence</i>	548
The Harberger Analysis	549
<i>Geometric-Intuitive Analysis</i>	551
<i>The Harberger Analytics</i>	554
Important Modifications of the Harberger Model	566
<i>Variable Factor Supplies</i>	566
<i>Oligopoly and the Corporation Income Tax</i>	569
<i>Heterogeneous Consumers</i>	570
References	571

17 Expenditure Incidence and Economy-Wide Incidence Studies

The Incidence of Government Transfer Payments	575
Tax and Expenditure Incidence with Decreasing-Cost Services	578
Samuelsonian Nonexclusive Goods	579
<i>The Incidence of Nonexclusive Goods: Empirical Evidence</i>	583
Economy-Wide Incidence Studies	585
The Sources and Uses Approach	586
<i>Annual Incidence Studies</i>	587
<i>The Pechman–Okner Studies</i>	588
<i>Mixing Annual and Lifetime Incidence</i>	593
<i>Pure Lifetime Tax Incidence</i>	595
<i>Lorenz–Gini Measures of Tax Incidence</i>	597
Computable General Equilibrium Models of Tax Incidence	603
Dynamic Tax Incidence	606
<i>The Auerbach–Kotlikoff OLG Model</i>	607
<i>The Fullerton–Rogers Lifetime CGE Model</i>	619
References	622

18 The Second-Best Theory of Public Expenditures: Overview

References 630

19 Transfer Payments and Private Information

First-Best Insights 632

The Samaritan's Dilemma 633

Cash Transfers: Broad-Based or Targeted? 634

An Acceptable Public Assistance Program? 636

The Earned Income Tax Credit 638

Special Needs, In-Kind Transfers, and Universality 639

Private Information and In-Kind Transfers 641

The Blackorby–Donaldson Model of In-Kind Transfers 641

The Besley–Coate Model of Workfare 646

Welfare Stigma 651

References 656

20 Externalities in a Second-Best Environment

The Second-Best Allocation of Samuelsonian Nonexclusive Goods 660

Relationships Between First-Best and Second-Best

Allocations 664

Concluding Comment 667

The Coase Theorem, Bargaining, and Private Information 668

Bargaining Set Stability and the Coase Theorem 669

Private Information 671

Concluding Comment 677

References 678

21 Decreasing Costs and the Theory of the Second-Best—The Boiteux Problem

The Boiteux Problem: The Multiproduct Decreasing-Cost Firm 680

Analytics of the Boiteux Problem 681

Public Agencies and Private Markets 687

<i>The U.S. Postal Service</i>	689
Constrained Government Agencies	690
References	691

22 General Production Rules in a Second-Best Environment

The Diamond–Mirrlees Problem: One-Consumer Economy	695
<i>Optimal Taxation</i>	698
<i>Optimal Government Production</i>	699
Production Decisions with Nonoptimal Taxes	701
<i>Tax Rules</i>	703
<i>Production Rules</i>	704
Second-Best Production Rules When Equity Matters	709
<i>Concluding Comments</i>	714
References	715

IV COST–BENEFIT ANALYSIS

23 Introduction: The Issues of Cost–Benefit Analysis

Three Principles of Cost–Benefit Analysis	720
<i>The Limits of Analytical Rigor</i>	720
<i>Quantifying the Present Value Formula</i>	720
<i>The Full Employment Assumption</i>	722
Issues Common to Cost–Benefit and Private Investment Analysis	722
<i>The Discount Rate</i>	722
<i>Uncertainty</i>	724
Problems Unique to Cost–Benefit Analysis	725
<i>Measurement Problems</i>	725
<i>The Distribution of Income</i>	727
Pitfalls in Cost–Benefit Analysis	728
Conclusion	729
References	729

24 The Rate of Discount for Public Investments

Three Factors Relevant to Present Value Calculations	733
<i>The Opportunity Cost of Public Funds</i>	733

<i>Reinvestment of Project Benefits</i>	738
<i>The Social Rate of Time Preference</i>	739
Theoretical Considerations from Normative Public Expenditure and Tax Theory	740
<i>The First-Best Environment</i>	740
<i>The Second-Best Environment</i>	741
The Bradford Model of the Public Sector Rate of Discount	743
<i>One-Period Government Investments</i>	745
<i>n-Period Government Investments</i>	746
Other Views on the Appropriate Rate of Discount	748
<i>Marglin–Feldstein: The Social Rate of Time Preference</i>	748
<i>Harberger and Sjaastad–Wisecarver: The Opportunity Cost of Funds</i>	750
<i>Conclusion</i>	752
Empirical Evidence on the Public Rate of Discount	753
<i>What Do the Experts Say?</i>	753
<i>Discounting Within the Federal Government</i>	755
<i>Concluding Observations</i>	756
References	756

25 Uncertainty and the Arrow–Lind Theorem

The Arrow–Lind Theorem	760
<i>Proof of the Arrow–Lind Theorem</i>	761
<i>Implications of the Theorem</i>	763
<i>Caveat: Single Versus Multiple Projects</i>	763
<i>Caveat: Externalities</i>	764
<i>Caveat: Actual Fiscal Systems</i>	765
<i>Further Reflections on the Arrow–Lind Theorem</i>	768
References	771

26 Measurement Problems in Cost–Benefit Analysis

Intangibles	775
<i>Valuing a Life</i>	775
<i>Limit Values of Intangibles</i>	778
Lumpiness	778
<i>First-Best Benefit Measures: A Single Price Change</i>	779
<i>First-Best Benefit Measures: Multiple Price Changes</i>	784
<i>First-Best Benefit Measures: General Technology</i>	785
<i>Benefit Measures: Second-Best Considerations</i>	785

Nonmarketed Benefits	788
<i>First-Best Environment</i>	788
<i>Second-Best Analysis</i>	797
The Use of Shadow Prices for Government Projects	800
References	802

27 Cost–Benefit Analysis and the Distribution of Income

Justifications for Ignoring Distributional Considerations	806
Justifications for Including Distributional Considerations	809
Incorporating Distributional Parameters	810
<i>Nonoptimal Income Distribution and Shadow Prices: The</i>	
<i>Boadway Framework</i>	811
<i>The Weisbrod Framework</i>	812
Conclusion	816
References	817

28 Common Pitfalls in Cost–Benefit Analysis

The Chain Reaction Game	820
The Regional Multiplier Game	822
The Labor Game	823
Pure Double Counting	825
The Public Sector Bias Charge	825
Conclusion	827
Reference	827

V FISCAL FEDERALISM

29 Optimal Federalism: Sorting the Functions of Government Within the Fiscal Hierarchy

The Potential for Incompatibilities and Destructive Competition	832
---	-----

<i>The Two Fundamental Sorting Questions of Fiscal Federalism</i>	833
<i>Social Welfare within Fiscal Federalism</i>	833
Sorting the Functions of Government within the Fiscal Hierarchy	834
<i>Stigler's Prescription for an Optimal Federalism</i>	835
<i>Oates' Perfect Correspondence</i>	836
<i>Oates' Decentralization Theorem</i>	837
<i>Misperceived Preferences</i>	839
<i>Local Autonomy in a First-Best Environment?</i>	840
Optimal Federalism and the Distribution Function	841
<i>Redistribution, the Competition Problem, and Potential Incompatibilities</i>	841
<i>Criticisms of the Prevailing Model</i>	843
<i>The Need for Local Social Welfare Functions</i>	848
<i>Optimal Redistribution in a Federalist System: An Alternative Model</i>	848
<i>Comments on Our Alternative Model</i>	851
References	853

30 Optimal Federalism: The Sorting of People within the Fiscal Hierarchy

The Modeling Dimensions	856
Jurisdiction Formation in Accordance with the Theory of Clubs	859
<i>Reaching the Optimum</i>	864
Fixed Communities and Housing Sites: Adding the Housing Market	866
<i>The Pauly Model of the Housing Market</i>	866
<i>The Hohaus–Konrad–Thum Model of Housing Market Distortion</i>	869
<i>Empirical Estimates of Public Services Capitalization</i>	872
Anything is Possible	873
<i>The Stiglitz Model</i>	874
Mobility and Redistribution	881
<i>The Brown–Oates Model</i>	881
<i>Uncertain Incomes</i>	883
<i>The Epple–Romer Model of Redistribution</i>	886
References	890

3 I The Role of Grants-In-Aid In a Federalist System of Governments

Optimal Federalism and Grants-In-Aid: Normative Analysis 893

First-Best Policy Environment 893

Second-Best Policy Environment 894

Alternative Design Criteria 898

The LeGrand Guidelines 899

Applying LeGrand's Principles: Bradbury et al. 901

Redistributing Through Matching Grants 903

Estimating the Demand for State and Local Public Services 905

The Median Voter Model 905

Surveys 916

The Response to Grants-In-Aid 920

The Flypaper Effect 920

Possible Explanations of the Flypaper Effect 924

Project Grants and Bureaucrats 925

References 928

INDEX 931

PREFACE

The second edition of *Public Finance: A Normative Theory* is a substantial revision of the original text. It incorporates four major lines of development in mainstream public sector theory since the publication of the original text in 1981:

1. The “new, new welfare economics” as described by Joseph Stiglitz in his chapter in the book entitled *The Handbook of Public Economics*. He was referring to the willingness to use flexible-form social welfare functions to incorporate society’s concern for equity, in both theoretical and policy analysis.
2. Private information about citizens that the government cannot know, at least not without some cost and effort. This has had an enormous impact on all dimensions of the mainstream normative theory.
3. Social decision theory, by which I am primarily referring to the mechanism design problem that goes hand-in-hand with private information.
4. The increasing use of dynamic models in economic analysis.

The first three receive the most emphasis and have led to entirely new chapters—Chapter 4 on social welfare, Chapter 15 on taxation under asym-

metric information, and Chapter 19 on second-best transfer payments—as well as to substantial revisions to most of the other chapters. Dynamic modeling is less featured in the revised text because of my desire to hold down the level of mathematical sophistication and because my impression is that it has had more of an impact on macro analysis than on micro analysis. It is central, however, to the revised Chapter 17 on tax incidence, the one micro area in which dynamic models have had a transforming impact on public sector theory. Overall, 18 of the first 22 chapters are either new or substantially revised, as are Chapter 26 in Part IV: Cost–Benefit Analysis and all three chapters in Part V: Fiscal Federalism.

A fifth line of development since 1981, the new political economy, does not receive much emphasis. The second edition pays more attention to political considerations than the original, but it is not a text on political economy. In my view, the new political economy derives more from the public choice perspective than the mainstream theory and would require a text of its own to receive an adequate treatment.

Despite the many revisions, the second edition will be familiar to users of the original text. It retains all the basic components of the original:

1. The text covers mainstream normative public sector theory and is entirely micro oriented. Positive and empirical studies are mentioned, but only as illustrative of the normative theory. Public choice theory is mentioned where appropriate but generally not developed.
2. The second edition retains the five-part structure of the original: an introduction; first-best public expenditure and tax theory; second-best public expenditure and tax theory; cost-benefit analysis; and fiscal federalism. These are the topics covered in the standard full-year Ph.D. field sequence in public sector economics.
3. The level of mathematical sophistication is designed to be appropriate for all Ph.D. programs in the United States and elsewhere as well as the better Masters programs.
4. Finally, the main thrust of the text is foundational rather than an attempt to present all the latest work in detail. I believe the foundational approach is most useful to the students, and allows the professors to take their courses where they will. Even so, I highlight important recent variations and extensions of the mainstream theory, sometimes with a fair amount of development.

Writing a textbook affords one the opportunity to say thank you. I again want to express my admiration of Peter Diamond and to thank him for his role in my intellectual development, as I had in the Preface to the original text. I had noted Peter's brilliant and innovative lectures on public sector theory at MIT in the late 1960s, as well as his influence in shaping Parts II and III of the text on public expenditure and tax theory. He more than anyone sparked my interest in public sector economics. I also want to acknowledge

my gratitude to Nan Friedlaender for her support and mentoring while I was a junior faculty member at Boston College. Nan was a superb empirical public sector economist and a wonderful person who was taken from us much too young. I especially want to thank Rebecca and Leo LeBlanc for undertaking the daunting task of typing the original text to computer files and doing so with remarkable accuracy. I am deeply grateful to them. A final heartfelt thank you goes out to the people at Academic Press for their help and encouragement in producing the text, particularly my editor J. Scott Bentley, production manager Paul Gottehrer, copyeditor Sarah Nicely Fortener, and marketing manager Mara Conner.

*Richard W. Tresch
Chestnut Hill, Massachusetts*

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PART



INTRODUCTION

The Content and Methodology of Public Sector Theory

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INTRODUCTION TO NORMATIVE PUBLIC SECTOR THEORY

THE FUNDAMENTAL NORMATIVE QUESTIONS

GOVERNMENT EXPENDITURE THEORY: PHILOSOPHICAL UNDERPINNINGS

Humanism, Consumer Sovereignty, Capitalism, and the Government

The Legitimate Functions of Government

The Goals of Government Policy

The Government as Agent

GOVERNMENT EXPENDITURE THEORY AND MARKET FAILURE

The Fundamental Theorems of Welfare Economics

The Distribution of Income

The Allocation of Resources

Private or Asymmetric Information

THE GOVERNMENT SECTOR IN THE UNITED STATES

THE THEORY OF TAXATION

FISCAL FEDERALISM

THE THEORY OF PUBLIC CHOICE

SUMMARY

Public sector economics is the study of government economic policy. Its primary goal is to determine whether government policies promote a society's economic objectives. This happens to be quite an ambitious goal. The advanced Western market economies experienced enormous growth in the size and influence of their government sectors during the last half of the twentieth century, and economic analysis of the public sector has reflected this growth. No single textbook on public sector economics can possibly hope to capture the variety and richness of the professional economic literature on government policy, even at an introductory level. Consequently, a public sector text must begin by defining its limits.

We have chosen to limit both the subject matter and the approach of this text. The text concentrates on the microeconomic theory of the public sector

in the context of capitalist market economies. The macroeconomic theory of the public sector, commonly referred to as fiscal policy, receives little attention. In addition, the text focuses on the normative theory of the public sector rather than the positive theory. The normative theory considers what governments ought to be doing in accordance with norms that are broadly accepted by a society. In contrast, the positive theory of the public sector emphasizes the incentives generated by existing governmental institutions and policies and their resulting economic effects, without necessarily judging their effectiveness in terms of some accepted norms. A complete separation of normative and positive theory is impossible, of course. A normative analysis must make assumptions about how agents will respond to various government policies; otherwise, it cannot predict whether a given policy will achieve particular norms. Therefore, the text pays some attention to the empirical literature on the responses to government policies—for example, how the supply of labor responds to income taxation. In every chapter, though, our primary emphasis is on the normative theory of government policy under standard assumptions about economic behavior, such as utility maximization by consumers and profit maximization by producers.

That a consensus, mainstream, normative theory of the public sector should have evolved at all in Western economic thought is perhaps surprising, yet there is remarkable agreement on the problems the government ought to address and the appropriate course of government action in solving them. The consensus has arisen in part because the vast majority of Western public sector economists embrace the same set of policy norms, even though their political tastes may vary along the entire liberal-conservative spectrum. In addition, most public sector economists have chosen the same basic model to analyze all public sector economic problems. Given the same norms and a common analytical framework, consensus was inevitable.

The only serious competitor to the mainstream view within public sector economics is the theory of public choice, the founding father of which is James Buchanan, a Nobel laureate in economics. Buchanan has garnered an enthusiastic following, and his public choice perspective has been influential in policy analysis. Public choice remains a distinctly minority view, however, and its approach is more positive than normative. For these reasons, this text considers the public choice perspective only when it has been especially influential in challenging mainstream positions.

The first three chapters introduce the mainstream normative theory of the public sector. Chapter 1 begins by describing the four fundamental questions that a normative analysis must address and shows how a particular set of values or norms shared by virtually all Western economists has produced a consensus on how to answer them. The chapter also introduces the public choice perspective on the economic role of the government.

Chapter 2 presents a baseline “textbook” version of the basic general equilibrium model that is used to develop normative public sector decision rules. The chapter emphasizes how the norms described in Chapter 1 are incorporated into the formal model.

Chapter 3 concludes the introductory material with two methodological points. The first point is the distinction between first-best and second-best analysis. First-best analysis assumes that a government is free to pursue whatever policies are necessary to reach society’s economic goals. It is restricted only by the two natural fundamentals inherent in any economy: individuals’ preferences over goods and factor supplies and the available production technologies for turning inputs into outputs. Second-best theory assumes, more realistically, that a government is constrained beyond the two fundamentals in pursuing society’s goals. For example, a government may lack the information it needs about individuals’ preferences or production technologies to design first-best policies, or it may be forced to use certain kinds of taxes that distort economic decisions.

The second methodological point relates to the political content of the baseline general equilibrium model developed in Chapter 2. The discussion centers on the General Impossibility Theorem of Kenneth Arrow, another Nobel laureate in economics. Arrow’s theorem, which he published in 1951, stands as one of the landmarks results of twentieth-century political philosophy.¹ He proved that, in general, the political decisions needed to achieve any social objective, economic or otherwise, cannot be made in a manner that would be acceptable to a democratic society. This was a devastating blow to the concept of a democratic or representative government. Any normative economic theory of the public sector must acknowledge the huge political shadow cast over it by Arrow’s theorem.

THE FUNDAMENTAL NORMATIVE QUESTIONS

A normative economic theory of the public sector addresses four fundamental questions:

1. The primary normative question, upon which all others turn, is the question of *legitimacy*: In what areas of economic activity can the government legitimately become involved? The legitimacy question points to the expenditure side of government budgets, asking what items we should expect to find there and why.
2. Once the appropriate sphere of government activity has been determined, the next question concerns how the government should proceed. What *decision rules* should the government follow in each area?

¹ K. Arrow, *Social Choice and Individual Values*, Wiley, New York, 1951.

Taken together, these two questions comprise the heart of normative public sector theory, commonly referred to as the theory of government expenditures.

3. The theory of government expenditures in turn suggests a third normative question: How should the government finance these expenditures? Analysis of this question provides the basis for a comprehensive *normative theory of taxation* (more generally, a theory of government revenues). The theory of taxation is not necessarily distinct from the theory of government expenditures, however. Frequently the decision rules for government expenditures incorporate taxes as part of the solution. When this occurs the theory of taxation is effectively subsumed within the theory of government expenditures. A common example is the use of taxes to correct for externalities. Often, however, expenditure theory does not specify a payment mechanism for financing particular expenditures, in which case the theory of taxation takes on a life of its own. For example, broad-based taxes such as the federal and state personal income taxes are used to finance a number of different expenditures. The design of these taxes depends on norms developed specifically to address the problem of how general tax revenues should be collected.

4. The fourth normative question arises in the context of a federalist system of governments. A federalist system is a hierarchical structure of governments in which each citizen is, simultaneously, a member of more than one governmental jurisdiction. The United States, with its national government, 50 state governments, and over 89,000 local government entities is but one example. Most countries have a federalist structure.

Having determined the legitimate areas of government activity in answering the first question, the *theory of fiscal federalism* raises two additional questions, both in the nature of assignment or sorting problems. The first concerns the assignment of functions throughout the fiscal hierarchy: Which tasks should each government perform? The second concerns the sorting of people within the fiscal hierarchy: Where should each person live?

A society must assign the legitimate functions of government among the various levels of government so that public policies do not work at cross-purposes in pursuing economic objectives. One can easily imagine potential conflicts arising without proper coordination, such as one government heavily taxing one group of people while another government is simultaneously trying to transfer income to the same group, or one town actively promoting industrial development that damages the environment of neighboring towns. The theory of fiscal federalism, then, accepts as given the normative rules for public expenditures and taxation established in response to the first three questions. It merely tries to ensure that these rules are followed consistently throughout the entire fiscal structure.

The sorting of people by jurisdiction is closely related to the assignment of functions, since people choose where to live partly in response to the expend-

iture and tax mix in different localities. Once people choose where to live, they then become voters who influence the expenditure and tax mix within that locality. Therefore, the movement of people across localities can affect how well lower level governments perform their assigned functions or, indeed, whether they can perform certain functions at all. The assignment of functions and people are the two main issues in the normative theory of fiscal federalism.

Parts II–IV of the text develop the normative theories of public expenditures and taxation under the assumption of a single government. Part V considers the special problems associated with a federalist system of government.

GOVERNMENT EXPENDITURE THEORY: PHILOSOPHICAL UNDERPINNINGS

The answer a society gives to the first normative question on the legitimate functions of government is culturally determined. It turns on essentially the same set of cultural norms and attitudes that lead to the choice of a particular economic system.

Economic systems are typically characterized as lying along a spectrum whose endpoints are centrally planned socialism and market capitalism in their purest forms. All actual economic systems are mixtures of the two. The four principal characteristics of pure centrally planned socialism are centralized economic decision making undertaken by a bureau of the national government; the use of a national plan developed by the central bureau to process all relevant economic information and coordinate economic exchanges; public ownership of capital, and possibly land as well; and the use of moral suasion to motivate agents to carry out the national plan “for the good of the state.” The four principal characteristics of pure market capitalism are decentralized economic decision making undertaken by individuals and firms; the use of markets to process all the relevant information that agents need to engage in exchange and to coordinate their economic exchanges; private ownership of capital and all other resources; and the use of material rewards to motivate agents to engage in exchange. A society’s view of the legitimate functions of government clearly depends upon whether it has chosen an economic system closer to centrally planned socialism or to market capitalism.

Humanism, Consumer Sovereignty, Capitalism, and the Government

The normative economic theory of the public sector that developed in the West is closely tied to market capitalism. This is hardly surprising, as all

the developed market economies in the West are positioned much closer to the capitalist end of the economic spectrum than to the socialism end of the spectrum. On a more basic level, however, the seeds of the preference for capitalism itself were planted when humanism swept through Europe in the fifteenth century and spawned the Reformation. Humanism was the philosophical revolution that replaced the quest for the divine with the quest for individual development and well being as the central purpose of human endeavor. Among other things, humanism established the principle of *consumer sovereignty* (and producer sovereignty) as a fundamental value judgment or norm in the conduct of economic affairs. The principle states that consumers (producers) are the best judges of their own well being and should be allowed to pursue their self interests toward this end. The decentralized nature of market capitalism, coupled with the private ownership of property, gave individuals (and firms) the freedom to pursue their self-interests. From a humanistic perspective, then, decentralization and private property are powerful attractions of capitalism, whatever other economic properties capitalism might possess. Likewise, the mainstream public sector theory became closely tied to market capitalism in the West because it, too, is rooted in humanism and takes the principle of consumer (and producer) sovereignty as a fundamental value judgment. The same can be said of any branch of Western economic theory—consumer economics, industrial organization, international trade, and so forth. Mainstream Western economists are all children of humanism.

The humanistic foundation of public sector theory has produced a consensus among Western economists on three issues related to the role of government in the economy: the legitimate functions of government, the appropriate goals of public policy, and how the government should proceed in pursuing the goals. In other words, there is broad agreement on the answers to the first two fundamental questions of the normative theory, the questions that comprise the theory of public expenditures.

The Legitimate Functions of Government

The government's economic role, broadly speaking, is to enhance the performance of the market economy. The market always takes precedence for solving agents' economic problems and allocating resources, and a perfectly competitive market economy is accepted as the ideal economic system. But even a perfectly competitive economy cannot solve all economic problems, and many markets are far from perfectly competitive. The government, therefore, has a legitimate role to play in a market economy.

Government activity gains its legitimacy through market failure. The government should perform those economic functions that markets cannot perform at all or that markets perform badly enough to warrant government

intervention. Reasonable people may disagree in particular instances on whether the market is performing “badly enough” to justify government intervention, but market failure is always the test. Government activity is never justified if markets are performing adequately. Despite the room for disagreement, there happens to be fairly broad agreement on the list of legitimate government functions implied by the market failure criterion. We will consider them below.

The Goals of Government Policy

The goal of any economic system is often loosely stated as promoting the economic well being of a nation’s citizens, in keeping with the humanist philosophy. The same goal applies to government policy as well. This goal is difficult to define more precisely, however. It cannot be to maximize each individual’s economic well being or even to allow individuals to reach their full economic potential. These goals may sound attractive, but they are meaningless because they violate the Law of Scarcity; only a limited amount of resources are available to promote each individual’s economic well being or economic potential. Therefore, Western economists have chosen two proximate goals that are directly related to individual well being as the principal economic objectives: efficiency and equity (fairness). When economists speak of promoting the “public interest,” they mean the public’s interest in efficiency and equity.

Efficiency

The efficiency criterion is the standard one of *pareto optimality* stated in terms of people: An allocation is efficient if it is impossible to reallocate resources such that one person can be made better off without making at least one other person worse off. Moreover, the people themselves must be the judges of whether they are better or worse off, by the principle of consumer sovereignty. An immediate corollary is that the government should pursue all *pareto-superior* allocations, those that make at least one person better off without making anyone else worse off.

Equity

The equity criterion is more difficult to define because neither economists nor anyone else have reached a consensus on what is equitable or fair in the realm of economic affairs. About all one can point to are some notions of equity that commonly appear in the economic literature. They fall into two categories: process equity and end-results equity. *Process equity* is a judgment about the rules of the economic game: Are the rules fair, independently of the outcomes that result? *End-results equity* is a judgment about the outcomes of the economic game: Are the outcomes fair, independently of how they were achieved?

Process Equity

One widely held norm of process equity is *equal opportunity*, or equal access, which says that all people should be allowed to pursue whatever opportunities they are willing and able to pursue. Equal opportunity rules out inappropriate forms of discrimination, such as denying people access to certain jobs on the basis of their race, religion, or sex. Another widely held norm of process equity is *social mobility*, which refers to the ability of individuals or families to move within the distribution of income or wealth over time. The antithesis of social mobility is the caste system, in which people are born into a certain position within the distribution and must remain there for life. One of the great attractions of a market economy is that it fosters both equal opportunity and social mobility so long as markets are competitive.

The call for process equity is most closely associated with the philosopher Robert Nozick, who believes that equity begins and ends with the rules of the game.² He argues that any outcome of a fair game is fair. In particular, if the rules of the economic “game” are fair, then any outcome the economy generates is inherently fair. Societies have tended to reject Nozick’s view on economic matters, however. Nations routinely make independent judgments about outcomes, especially about the extremes of poverty and wealth. They have been willing to transfer resources to the poor in cash and in kind to ease the burden of poverty, paid for by taxes on the non-poor. The United States went so far as to declare a war on poverty in 1964 with the intent of eradicating poverty.

The majority of economists worry about end-results equity as well. One reason why may be that the rules governing the game are commonly seen to be inherently unfair. Think of the game as a race to economic well being run within the confines of a market economy. The problem with the race occurs at the starting line. The outcomes in a market economy depend to a considerable extent on the resources that people can bring to the marketplace, and some of these resources are beyond their control. Those born into high-income families with highly educated parents have a much better chance of succeeding than those born into low-income families with poorly educated parents. A person’s genetic make-up also matters. Some people are naturally bright, outgoing, and competitive, traits that tend to be rewarded in the marketplace. Others possess special talents such as exceptional athletic ability that are very highly rewarded. Still others lack any of these traits. In effect, then, people are forced to begin the economic race to well being at very different starting lines through no fault of their own. Given the widely unequal chances of success, many people are quite willing to make independ-

² R. Nozick, *Anarchy, State, and Utopia*, Basic Books, New York, 1974. See also Hal Varian’s excellent mainstream critique of Nozick’s position in H. Varian, “Distributive Justice, Welfare Economics, and the Theory of Fairness,” *Philosophy and Public Affairs*, Vol. 4, 1974–75.

ent judgments of the outcomes according to their perceptions of end-results equity and to adjust the outcomes by redistributing if necessary.

Of course, people may be quite willing to judge economic outcomes without much concern about the underlying process that generated them. For example, they may simply take pity on the poor without caring how they became poor. Whatever the motivation, the quest for end-results equity figures prominently in normative public sector theory.

End-Results Equity

End-results equity has proven to be an extremely elusive concept. The quest for end-results equity is often termed the quest for distributive justice—that is, a just distribution of income—but trying to determine the just distribution of income runs into a fundamental difficulty that can be seen in terms of redistributing income toward the “just” distribution. Suppose the government engages in a tax-transfer program in an attempt to reach the just distribution. How large should the program be? To know when to stop redistributing, the government must somehow compare the losses of the losers (those who are taxed) with the gains of the gainers (those who receive the transfers). Unfortunately, no one, not economists or anyone else, has ever come up with a compelling way to do this. Indeed, economists are skeptical of any attempt to make interpersonal comparisons of well being. Yet some means of comparing gains and losses across people must be made for end-results equity to be operational; otherwise, no one can know how much to redistribute to arrive at the “just” distribution.

In truth, all we have is a range of suggestions to serve as guidelines for end-results equity. To give one example, Lester Thurow argues that there is a strong bias for equality in the United States, so strong that the burden of proof is on inequality—inequality in the distribution of income always has to be justified.³ The common economic justification for tolerating inequality rests on efficiency grounds, that the taxes and transfers used to redistribute generate inefficiencies in the economy. Most economists would argue that the marginal inefficiency costs of further equalizing the distribution outweigh the marginal benefits in terms of end-results equity at a point well short of full equality.

Thurow’s position on the bias toward equality may seem extreme, but we will see in Chapter 4 that it has generally been incorporated into public sector theory. The models commonly used by public sector economists to express a concern for end-results equity have the property that everyone should end up with the mean level of income if taxes and transfers do not generate any inefficiencies.

³ L. Thurow, *Generating Inequality: Mechanisms of Distribution in the U.S. Economy*, Basic Books, New York, 1975, chap. 2, especially pp. 26–27.

The only widely accepted norm within end-results equity is the principle of *horizontal equity*, which calls for equal treatment of equals: Two people who are equal in all relevant economic dimensions, such as ability and productivity, should enjoy an equal amount of well being. We will see that horizontal equity has considerable standing among public-sector economists in the design of tax policy. Horizontal equity also provides a link between process equity and end-results equity. Equal opportunity in the marketplace leads to horizontal equity; equals are treated equally in the long run when there are no barriers to entry.

A related principle of end-results equity is *vertical equity*, which says that unequals may be treated unequally. This principle, even if accepted, begs the difficult question of just how unequally society should treat unequals. We know that people who are unequal in ability and productivity can be treated very unequally in a market economy, even if markets are perfectly competitive. Some earn fabulously high incomes, while others do not earn enough to escape poverty. How much inequality should be tolerated? There is no consensus at all on this question, which is hardly surprising. After all, the quest for vertical equity is the same as the quest for distributive justice.

The Government as Agent

The humanistic value judgment of consumer sovereignty has one final and rather remarkable implication for normative public sector theory that concerns the way the government should proceed in designing its policies. The government is not supposed to have a will of its own, in the sense that government officials are not permitted to interject their own preferences into the design of policy. Instead, the proper role of the government is that of an agent acting on behalf of the citizens. The idea is this. Suppose that the market system fails in some way that legitimizes government intervention. The government is expected to design policies to set the economy back on the path toward efficiency or equity, but in doing so it should follow only the preferences of its citizens. The preferences of the president or the members of the legislature carry no special weight; these people are just more of the many citizens.

The government-as-agent viewpoint has considerable standing in the United States. It is essentially the view expressed by Abraham Lincoln in his Gettysburg Address when he referred to the government being of the people, by the people, and for the people. Lincoln was simply reminding us that the purpose of democratic or representative forms of government is to follow the will of the people. Nonetheless, accepting this view of government severely limits the scope of public sector theory. It implies that the theory is not meant to be a theory of government behavior in the sense of recognizing

the state as an organic being with a (political) life of its own. It also consciously removes the theory from the reality that government officials are constantly interjecting their own preferences into the decision-making process. They do not simply follow the preferences of their constituents.

Ignoring the preferences of public officials is clearly a severe limitation for a political theory of the government, but it happens to be a source of richness and subtlety for an economic theory. A normative economic analysis based solely on the preferences of some group of government administrators would be little more than an exercise in the theory of consumer behavior: What are the administrators' objectives? What choices are available to them? What constraints are they operating under? These may be interesting practical questions, but they do not carry much normative weight.

By forcing the government to consider only the preferences of its citizens, however, all sorts of interesting and difficult problems arise. For example, what should the government do if individual preferences clash, as they inevitably will? Suppose one group of citizens wants more spending on national defense, while another group wants less spending. How should the government resolve this conflict? Normative theory must provide answers to questions such as these.

Other puzzling questions arise as well about the appropriateness of government intervention. If the market system cannot solve a particular problem, acting as it does on individual preferences, why should the government be able to do any better, if all it has to work with are the same individual preferences? A strict libertarian economist might insist that government intervention can only be justified if markets fail *and* if it can be demonstrated conclusively that some *viable* government policy will actually improve upon the market results. Most economists have been content to assign to normative theory the lesser task of describing a *potential* improvement through government action. But this does leave open the question of whether some normative policy prescription really is viable, and, if not, whether a different, viable, policy can actually improve social welfare.

This question lies at the heart of *social decision theory*, a rapidly expanding subspecialty within public sector economics. Social decision theory analyzes the problem of designing practical decision rules and procedures that will actually achieve optimal normative policies. One of its main concerns is whether democratic voting procedures are consistent with economic efficiency and equity. Another concern is whether government policies can be decentralized, the alternative being government provision or some form of coercion.

As one might expect, sometimes there are clear answers to practical questions such as these, and sometimes not. In any event, it is the principle of consumer sovereignty and the government-as-agent perspective that makes them all so compelling.

GOVERNMENT EXPENDITURE THEORY AND MARKET FAILURE

The Fundamental Theorems of Welfare Economics

Since legitimacy for government intervention is defined in terms of market failure, the natural question to ask is “In what sense do markets fail?” To determine the answer, let’s begin with the problem of achieving an efficient allocation of resources.

The market system is entirely neutral with respect to society’s well being, of course. Nonetheless, if conditions are right, competitive markets generate an efficient allocation of resources. The problem for a market economy is that the conditions or assumptions underlying a perfectly functioning market system are far too strong. They typically do not hold in practice, and when they do not a public policy can be described that is pareto superior to the free-market allocation of resources. That is, the public policy can reallocate resources so as to make at least one consumer better off without making any other consumer worse off. This principle underlies all normative policy prescriptions concerned with the allocation of resources.

To determine the subject matter of normative public sector theory, then, consider the assumptions that would allow a market economy to achieve a pareto-optimal allocation of resources. These “best” assumptions fall into two distinct groups: a set of *market assumptions* about the structure of individual markets within the market economy and a set of *technical assumptions* about consumers’ preferences and production technologies.

The market assumptions are necessary to assure that all markets are perfectly competitive, so that each economic agent is a price taker and acts on full information. This is the case if four assumptions hold:

- a. There are large numbers of buyers and sellers in each market.
- b. There is no product differentiation within each market.
- c. All buyers and sellers in each market have access to all relevant market information.
- d. There are no barriers to entry or exit in markets.

The technical assumptions are required to assure that both consumption and production activities are “well behaved,” so that perfectly competitive markets do generate a pareto-optimal allocation of resources. Consider the following set of technical assumptions:

1. Preferences are convex.
2. Consumption possibilities form a convex set.
3. No consumer is satiated.
4. Some consumer is not satiated.
5. Preferences are continuous.
6. Individual utility is a function of one’s own consumption and own factor supplies.

7. An individual firm's production possibilities depend only upon its own inputs and outputs.
8. Aggregate production possibilities are convex.

Assumptions 6 and 7 rule out the possibility of externalities in either consumption or production. Assumptions 1, 2, and 5 on individual preferences are satisfied by the standard assumptions of consumer theory, that utility functions are quasi concave, continuous, and twice differentiable. Assumptions 3 or 4 are commonly employed in economic analysis. Assumption 8 on aggregate production possibilities implies constant or increasing opportunity costs and is satisfied if all individual firms' production functions are continuous, twice differentiable, and exhibit either decreasing or constant returns to scale. Assumption 8 rules out significant increasing returns to scale production, which would imply decreasing opportunity costs, or a production-possibilities frontier convex to the origin.

Gerard Debreu has shown that:⁴

- a. If assumptions 1, 2, 3, 6, and 7 hold, then a competitive equilibrium is a pareto optimum.
- b. If assumptions 1, 2, 4, 5, 6, 7, and 8 hold, then a pareto optimum can be achieved by a competitive equilibrium with the appropriate distribution of income.

Results (a) and (b) are the *two fundamental theorems of welfare economics*.

Debreu's fundamental theorems of welfare economics have the following implication for public policy. If the four market assumptions hold so that all markets are perfectly competitive, and the combination of technical assumptions specified under (a) or (b) of the fundamental theorems of welfare economics hold as well, then the government sector would not be required to make any decisions regarding the allocation of resources. Indeed, it would not be permitted to do so, according to the normative ground rules.

The Distribution of Income

If all the appropriate market and technical assumptions hold, would there be anything at all for the government to do? The answer is yes, because of society's concern for end-results equity. A perfectly functioning market system can assure an efficient allocation of resources. Perfect competition also satisfies the process equity norm of equality of opportunity and is likely to ensure a high degree of social mobility. But, even a perfectly functioning market economy cannot guarantee that the distribution of the goods and services will be socially acceptable. As noted above, the market takes the ownership of resources as a given at any point in time. If society deems

⁴ G. Debreu, *The Theory of Value: An Axiomatic Analysis of Economic Equilibrium*, Wiley, New York, 1959, chap. 6.

the pattern of ownership to be unjust, then it will probably find the distribution of goods and services produced by these resources to be unjust as well. Moreover, there are no natural market mechanisms to correct for distribution imbalances should they occur, nothing analogous to the laws of supply and demand which, under the stringent conditions listed above, automatically select pareto-optimal allocations. Thus, a decision concerning the distribution of income is the first order of business in public sector economics in the sense that it cannot be assumed away. Even in the best of all worlds, with all the appropriate market and technical assumptions holding, the government has to formulate some policy with respect to the distribution of income if society cares about end-results equity. Society might simply choose to accept the market-determined distribution, but this is still a distribution policy requiring a collective decision on the part of the citizens even though it involves no actual redistribution. Moreover, no country has ever made this choice. At a minimum, then, a normative theory of the public sector must address the fundamental question of distributive justice: What is the optimal or just distribution of income?

We have already noted that the search for an optimal income distribution has not achieved a consensus. The only point to add is that any attempt to solve the distribution question is at odds with the preferred government-as-agent ground rule that follows from the principle of consumer sovereignty. By its very nature, a redistribution of income must violate the principle of consumer sovereignty, so long as the losers in the redistribution do not willingly surrender some of their incomes. Therefore, redistribution policy cannot be based entirely on consumers' preferences, with the government simply acting as a passive agent acting on their preferences. It requires a collective decision articulated through some kind of political process, one in which government officials are likely to play a very active role. Normative public sector theory cannot be entirely devoid of political content. Politics necessarily enters the theory through society's attempt to resolve the distribution question.

The collective political decision is troublesome for normative public sector theory, however, because of the lack of a consensus on a set of distribution norms to guide the decision. Furthermore, the theoretical difficulties spread far beyond the distribution question. Since an economic system is a closed system in which all decisions are ultimately interrelated, any public policy decision on the distribution of income necessarily affects all the allocational issues as well. The government cannot simply make a particular redistributional decision, for better or worse, and be done with it.

Public sector economics has never totally come to grips with this problem. Economists have all too often assumed away distributional problems in order to analyze more comfortable allocational issues, knowing full well that separating allocational and distributional decisions is often not legitimate and may produce normative policy prescriptions quite wide of the mark. Some theoretical studies that do incorporate distributional considerations into their

models make no attempt to justify particular distributional norms. Rather, the government's distributional preferences are simply taken as given, and normative policies are described with respect to these preferences. The spirit of the analysis is to "have the government provide us with a set of distributional preferences, and we will tell it what it should do." Perhaps this is all economists can hope to do with the distribution question, but it is at least unsettling that the resulting policy decision rules depend upon an assumed pattern of distributional preferences that has no special normative significance.

The Allocation of Resources

The allocational issues in public sector economics follow directly from a breakdown in the market and technical assumptions necessary for a perfectly functioning market system. Many of the market and technical assumptions do fail to hold in practice, so there is broad scope for legitimate government activity. A long tradition within the profession held that the study of failures in the market assumptions typically fell within the domain of industrial organization or consumer economics. These fields analyze such problems as monopolistic behavior and imperfect information, along with the corresponding public policy responses such as antitrust and consumer-protection legislation. Public sector economics, or public finance, traditionally limited its concern to breakdowns in the technical assumptions,⁵ concentrating primarily on *externalities* and *increasing returns* or *decreasing cost production*.

Private or Asymmetric Information

This traditional division has broken down in one respect over the past 20 years, around the problem of imperfect information. Economists have been particularly interested in the consequences of asymmetric information, in which some individuals have private information that other individuals do not know. Private or asymmetric information is so common in exchange that

⁵ The theory of fiscal policy can also be thought of as a response to a breakdown in the market and technical assumptions. For example, externalities play a role in the two main themes of macroeconomic policy, stabilizing the business cycle and promoting optimal long-run economic growth. New Keynesians argue that coordination problems are an important determinant of the wage and price stickiness that gives rise to the business cycle from the demand side. The economy would operate closer to its production frontier, on average, if workers and firms would agree to index wages and prices to the rate of growth in aggregate demand. But individual firms and workers are not willing to index unless they can be assured that all workers and firms will index, and coordinating an economy-wide indexing is difficult to accomplish in practice. Therefore, wages and prices remain largely unindexed. Similarly, externality problems help to explain why a nation's rate of saving might not be optimal, at a rate consistent with the Golden Rule of Accumulation, which maximizes consumption per person over time. Externalities are also central to the newer endogenous theories of long-run economic growth (for instance, all those theories that point to the spread of knowledge as an engine of growth).

it is has become a focus of analysis in all fields of economics, including public sector economics. Some reflection on the relationship of private information to government policy is in order, because economists have come to realize that private information has a profound effect on normative public sector theory.

Private information is, first of all, an important source of market failure that requires government intervention. The general problem with private information is that it tends to undermine market exchanges because it gives an undue advantage to those who have it. They can easily cheat the other parties. This is why even the most libertarian of economists acknowledge the need for a judicial system to enforce contracts and define private property rights. It also leads to agencies such as a bureau of standards to protect consumers from fraud (e.g., to ensure that a gallon of gasoline at the pump really is a gallon), and the Occupational Safety and Health Administration (OSHA) to ensure that workers understand the hazards of their jobs. People want independent certification from the government that producers are telling the truth about products and working conditions.

The widespread provision of public insurance is another important example of a response to market failure caused in part by private information. Private firms are willing to provide insurance against risky events only if a number of conditions hold. Among them is the requirement that they have good information about the insured. Absent good information, the insurance companies are exposed to the *principal-agent problem*. The structure of the problem is that a principal is in charge of a set of agents who have different objectives from the principal. Therefore, the principal has to monitor the agents so that they will behave in accordance with the principal's objectives, and the principal needs good information about the agents to monitor them effectively.

In the case of insurance markets, each insurance company (the principal) needs to be able to monitor the insured (the agents) to write profitable policies. For starters, the companies need to know the riskiness of the insured so that they can adjust their premiums according to risk (e.g., higher auto insurance premiums for the more risky drivers). Otherwise, they are forced to charge one premium for all risk classes, and the low-risk policy holders have an incentive to drop out and form their own group. This phenomenon is called *adverse selection*, because it leaves the insurance companies with an ever-riskier (adverse) pool of the insured, and the companies must charge ever higher premiums to earn a profit. At some point, the premiums may become too high to attract a large enough pool of high-risk policy holders, leaving the high-risk people without any insurance. Insurance companies also have to be confident that their policy holders cannot influence the probability of the event being insured against unbeknownst to the company (e.g., unhealthy live styles that are difficult for the medical insurers to detect). The ability to change the odds of the insured event is called *moral hazard*, and it is

a clear threat to the profitability of the insurance companies. Private firms may not provide insurance if either adverse selection or moral hazard is a possibility; consequently, people who want the insurance must turn to the government to provide it. In fact, the governments in most of the developed market economies operate large public insurance programs.

At a deeper level, private information threatens the government-as-agent role that the government is supposed to play when trying to solve allocational problems. The government obviously must know the preferences of the people to be an effective agent on their behalf. But if people have private information, they often have an incentive to hide their true preferences from the government to get a better deal for themselves by having others “play the sucker.” The government cannot hope to achieve pareto-optimal allocations if the people will not reveal their preferences, as pareto optimality is defined in terms of each individual’s own preferences.

Unfortunately, getting self-interested people to tell the truth is a difficult problem in the context of many allocation issues, as we shall see throughout the text. A major research agenda in social decision theory is the *mechanism design problem*: how to design preference-revealing mechanisms such that the dominant, utility-maximizing strategy is for people to reveal their true preferences. Some truth-revealing mechanisms have been described, but most are not practicable. The one exception has been in the design of auctions used by the federal government to sell rights to oil reserves and telecommunication bandwidths.

Getting people to reveal the truth about themselves is also a central problem in designing tax and transfer policies. Governments do not want people to escape taxes or receive inappropriate transfers by claiming to be something other than what they are. Economists have been successful in designing tax-transfer policies that are truth revealing, but having to design the policies in this way still undermines the government-as-agent ideal because it wastes resources relative to the case of perfect information. (See later discussion of tax theory.)

At the deepest level, private information can be viewed as the fundamental justification for *all* government intervention directed at allocational problems. To see why, suppose that everyone did have full information, as Debreu’s fundamental theorems of welfare economics assume. If so, then self-interested individuals would presumably use their knowledge to extract all possible pareto-superior gains from the economy because they have a mutual interest in doing so. They would employ whatever means are necessary—markets, various forms of private negotiation and bargaining, side payments to exploit all the gain–gain opportunities. The economy would naturally achieve a pareto-optimal allocation of resources, without the aid of any kind of government policy. This would be true even if the other market and technical assumptions failed to hold. The economy could be riddled with market power, externalities, and decreasing cost production. Yet self-interested

agents with perfect information would discover the pareto-superior allocations for all these problems.

The only limitation on these private exchanges would be the transactions costs of making them, which Debreu's analysis assumed away. In some cases, the transactions costs might exceed the potential gains from an exchange, but to argue that transactions costs are a justification for government intervention under perfect information is not entirely convincing. People are unlikely to have perfect information about each other if significant transactions costs hinder their exchanges and negotiations. The assumptions of perfect information and insignificant transactions costs tend to go hand in hand. Furthermore, if transactions costs prevent private exchanges from occurring they may also prevent government agencies from improving on the private allocations. Why should the government have an advantage in reducing transactions costs over coalitions of private citizens armed with perfect information?

The only obvious role for the government under perfect information would be distributional, to redistribute income if necessary in accordance with society's norms regarding end-results equity. There would be no need for any normative economic analysis relating to allocational problems, not in public sector economics or in any other field of economics. Therefore, private information may well be the ultimate justification for government intervention in correcting all allocational inefficiencies.

THE GOVERNMENT SECTOR IN THE UNITED STATES

Limiting the allocational functions of government to externalities, decreasing cost production, and private information within public sector economics may seem highly restrictive, yet nearly all the exhaustive or resource-using expenditures on goods and services in the United States can be justified in terms of these conditions. We have already noted the justification of the judicial system, various bureaus of standards or safety, and public insurance programs on the basis of private information. Examples of U.S. government programs justified in terms of externalities include defense, the space program, and related activities, which together comprise the overwhelming majority of exhaustive expenditures in the national budget; education, which accounts for nearly 40% of all state and local exhaustive expenditures; and many lesser items such as local public safety and government-supported research and development programs. Public services exhibiting significant increasing returns-to-scale production include many types of public transportation (which frequently generate externalities as well), the public utilities (electricity, water, and sewerage), many recreational facilities (public parks and beaches), and radio, television, and other forms of communication such as the Internet, which may well be among the purest examples of decreasing cost services.

Table 1.1 lists the expenditures of the U.S. federal (FY2001), state (FY1999), and local (FY1999) governments. The data underscore the view

TABLE I.1 Expenditures by Federal, State, and Local Governments in the United States

	Expenditures (\$, billions)	Percentage of Subcategory	Expenditures (\$, billions)	Percentage of Total Expenditures (%)
A. Federal government (FY2001) ^a				
Government expenditures on goods and services			411	22
Defense and defense-related	336 ^b	82		
Non-defense	75	18		
Domestic transfers to persons (direct expenditures)			923	50
Social insurance and pensions				
Social Security benefits (OASDI)	430	47		
Medicare	238	26		
Civilian and military retirement	87	9		
Unemployment Insurance	26	3		
Agricultural support payments	22	2		
Veterans benefits ^c	45	5		
Public assistance				
Food Stamps	20	2		
Housing assistance	25	3		
Supplemental Security Income (SSI)	26	3		
Earned Income Tax Credit (EITC)	26	3		
Net interest payments			206	11
Grants-in-aid			316	17
Payments to individuals	204	65		
TANF	21	7		
Medicaid	128	41		
Other	112	35		
Total expenditures			1856	100
B. State governments (FY1999) ^d				
Direct expenditures			585	66
Public welfare	182	31		
Education	114	19		
Highways	18	3		
Health and hospitals	54	9		
Other	217	37		
Grants-in-aid			305	34
Total general expenditures			890	100.0

(Continues)

TABLE 1.1 (*Continued*)

	Expenditures (\$, billions)	Percentage of Subcategory	Expenditures (\$, billions)	Percentage of Total Expenditures (%)
C. Local governments (FY1999) ^d				
Education			315	45
Housing and community development			23	3
Health and hospitals			63	9
Public safety			45	6
Public welfare			33	5
Highways, airports, other transportation			38	5
Other			186	26
Total general expenditures			703	100

^a The data for the federal government are estimated outlays.

^b Includes national defense; general science, space, and technology; and international affairs.

^c Includes education benefits, medical benefits, insurance benefits, and compensation, pension, and burial payments.

^d Data for state and local governments were available only through fiscal year 1999.

Sources: *Budget of the United States Government, Fiscal Year 2002, Supplement, February 2001*, U.S. Government Printing Office, Washington D.C., 2001, Part Five: Historical Tables, Tables 3.1, 3.2, 11.1, 11.2, 12.1, and 12.3. U.S. Census Bureau, <http://www.census.gov/govs/estimate/9900us.html>. *State and Local Government Finances by Level of Government, 1998–99*, U.S. Summary.

put forth in this introduction chapter that market failure is the primary justification for government intervention in the United States. On the one hand, most of the resource-using purchases of goods and services exhibit either externalities or increasing returns. On the other hand, purchases of goods and services accounted for only 22% of total federal expenditures in fiscal year 2001. The remainder were transfer payments: transfers to persons or grants-in-aid to state and local governments or interest payments on the national debt. The transfers to persons, the largest category, are primarily redistributive in their impact.⁶ As such, they too can be considered a response to market failure, namely the inability of the market system to guarantee an acceptable distribution of income. Also, a large proportion of the grants-

⁶ As noted above, the large public insurance programs have an informational justification. Nonetheless, the problems of adverse selection and moral hazard do not disappear with government provision of insurance. Public insurance programs inevitably redistribute from low-risk to high-risk individuals and from the honest to those engaging in moral hazard. These unintended redistributions may help to explain why public insurance programs are strenuously opposed by so many taxpayers.

in-aid help the state and local governments pay for two of the largest public assistance programs targeted to the poor, Temporary Assistance to Needy Families (TANF) and Medicaid. These two programs are administered by the states (and localities in some states). Finally, the largest single government program, Social Security (including Medicare), reflects a mixture of motives based on market failure: redistributional (the elderly are vulnerable to becoming impoverished in a market economy without public pensions); insurance (relating to uncertainty about the timing of death and the problems of private information inherent in medical insurance); and paternalism (without the forced savings through payroll taxes to pay for Social Security benefits, many people might not save enough for their retirement and would risk becoming wards of the state).

THE THEORY OF TAXATION

Most of the remarks thus far have been directed to the theory of public expenditures as opposed to the theory of taxation, because the former is logically prior to the latter. Public expenditure theory defines the legitimate areas of public concern as well as the permissible forms that policy may take. Moreover, as indicated above, public expenditure theory often contains its own theory of taxation in the sense that the expenditure decision rules define a set of taxes and transfers necessary to guide the market system to an optimum. Taxes contribute to the pursuit of efficiency and equity in these instances.

The theory of taxation becomes interesting in its own right only when the expenditure decision rules indicate the need for specific government expenditures without simultaneously specifying how those expenditures are to be financed. When this occurs, the same criteria that guide public expenditure analysis also apply to the collection of tax revenues. In particular, taxes should promote society's microeconomic goals of allocational efficiency and distributional equity.

A natural tension arises between tax policy and the goal of allocational efficiency, however. Most taxes generate distortions in the market system by forcing suppliers and demanders to face different prices. These distortions misallocate resources, thereby generating allocational inefficiencies. Resource misallocation is not desirable, of course, but it is an unavoidable cost of having to raise tax revenues. One goal of normative tax theory, then, is to design taxes that minimize these distortions for any given amount of revenue to be collected. Alternatively, if the government must use one of two or three specific kinds of taxes to raise revenue, normative tax theory should indicate which of these taxes generates the minimum amount of inefficiency.

Normative issues such as these are part of the allocational theory of taxation and, just as with the allocational issues of public expenditure theory,

the guiding principle is pareto optimality. According to the pareto criterion, the government should collect a given amount of revenue such that it could not raise the same amount of revenue with an alternative set of taxes that would improve at least one consumer's welfare without simultaneously lowering the welfare of any other consumer. If such pareto improvements are impossible, then tax policy satisfies the pareto criterion of allocational efficiency, even though it necessarily generates inefficiencies relative to a no-tax situation.

The second unavoidable effect of taxes is that they reduce taxpayers' purchasing power so that they necessarily become part of the government's redistributive program. The government naturally wants its taxes to contribute to society's distributional goals, but there are two difficulties here. The first is that the redistributive theory of taxation suffers from all the indeterminacies of redistributive theory in general. Thus, while public sector economists generally agree on normative tax policy with respect to society's allocational goals, there is considerable disagreement as to what constitutes good tax policy in a distributional sense. The second difficulty is the inherent trade-off between equity and efficiency in taxation. Generally speaking, achieving greater redistribution requires levying higher tax rates on the "rich" but, as we shall discover, higher tax rates tend to increase inefficiency. In addition, taxing a particular good might be desirable in terms of society's distributional goals but highly undesirable on efficiency grounds, or vice versa. Understanding the nature of these kinds of equity-efficiency trade-offs has always been a primary goal of normative tax theory.

Two additional subsidiary goals of tax policy are *ease of administration* and *simplicity*, which relate to the practical problem of collecting taxes. The ease-of-administration criterion adopts the tax collectors' point of view. A tax has to be easy for a department of revenue to administer or it will not be used. Private information comes directly into play here. Self-interested taxpayers have a strong incentive to avoid paying taxes, and they can do so if they are able to hide information about themselves from the government's tax collectors. Illegal avoidance of taxes is called *tax evasion*. Legal sanctions or just plain old honesty may prevent some people from cheating on their taxes, but not everyone. Therefore, the design of any tax has to address the problem of potential evasion.

Consider an income tax as an example. Suppose the government wants to tax high-income taxpayers at a higher rate than low-income taxpayers as part of its redistributive policy. It may not be able to do this, however, if high-income taxpayers can hide much of their income from the authorities and thereby evade much of their proper tax liability. Also, the hiding of income forces the government to raise average tax rates to collect a given amount of revenue, which increases the inefficiencies associated with the tax. Finally, some taxes are easier to evade than others. Therefore, the relative ease of