

**HOUSING POLICY AND COMMON SENSE:  
AN INQUIRY AND A METHOD**

**BY**

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To my father, my mother, my wife, and my children.

## Preface

The ideas contained herein began to take shape almost twenty-five years ago, when I began my first face-to-face work with persons different from me, and I encountered conflicting world views. First as a tutor, then as volunteer in child welfare institutions and a mental hospital, I learned about those who fell through the cracks, and how those who care for them also become reconciled to what they perceive to be insoluble problems. As a therapist intern in a municipal mental health center, I met concentration camp survivors, the abused, and the confused.

As a taxicab driver during my first graduate school I met the richest and the poorest, the well housed and the ill housed, in hundreds of different neighborhoods. Moonlighting as a piano technician while I edited a small magazine or taught high school, I visited thousands of homes throughout the Chicago metropolitan region, and learned how different the world appears for urban neighbors.

In the spring of 1977 I sat in a high-rise apartment in Chicago's Rockwell Gardens public housing development, waiting for the graduation party of a young friend to begin. There was a single bowl of potato chips on the table, while mother put the finishing touches on the meal. A dozen young people did not touch the potato chips, but waited for mother to sit down and eat. The potato chips happened to be one of three main courses. Respect for this working mother was unbounded--a small epiphany for me about a people so polite who did not at all deserve the rank stairwells and the daily gauntlet of bullies and thieves.

When I taught high school I noted how much more learned were the children who had the luxury of a quiet room away from arguments and television, and how important housing was to the "life chances" of a child. Having grown up in the housing business, I returned to it, technical skills accruing, while my own family grew.

## Preface (continued)

This work, with its integration of several world-views, is the product of years of practice, study, and reflection. It is not by a twenty-five year old whiz kid, but a forty-year old father of five trying to keep up with the whiz kids. I hope that it is a much better work because of this.

The intellectual problem driving me to write was to reconcile the political, legal, and planning traditions of American democracy with modern social science theories--especially as they pertain to housing, accompanied by a continuing thirst for effective social improvements along the lines of subsidiarity and solidarity as developed in Catholic social thought, the values to which I ascribe. This led me to develop the notion of common sense as a complex sense of certainty which can be "refuted" in public action.

I undertook this research to try to answer my question while I sought better work, and look forward to more work on these questions. In the past seven years, a number of family illnesses and subsequent surgeries (with beneficial results) have given me much time to reflect upon housing policy and the process of making practical and irreversible decisions. During this time I was blessed with the opportunity to return to our family building and real estate business as a practitioner, while intermittently working as a researcher in a municipal planning department, teaching in a graduate school of planning and policy, working and consulting on quality management, and for almost a decade coordinating charitable services to the homeless. Therefore, what began as a look at housing from a technical standpoint, grew into an overview of how we reason about housing policy and how we understand the policy tools that we use.

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Without the support and understanding of my wife Betsy, parents Albert and Cora, and children Rebecca, Thomas, Michael, Albert, and Elizabeth, this work would not have been completed. The late Sr. Dolores (Alma) Schorsch, OSB, whose dissertation on John Dewey anticipated much in American education (Schorsch, 1953), urged me on from her deathbed and from beyond, as did my late uncle Robert (Schorsch, 1944), an Yves Simon protege and wartime casualty, as did my late great uncle Rev. Alexander Schorsch, CM, and the example of my steel-industry scholar cousin Louis (Barnett and Schorsch, 1983).

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A number of other scholars at other institutions assisted me in key ways. James Poterba of the Massachusetts Institute of Technology was kind to send me copies of his work in progress on two occasions. Brian J. L. Berry of the University of Texas at Austin helped

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When I first began my studies at UIC, there were two PhD graduates from our Public Policy Analysis program at the School of Urban Planning and Policy. There are now over two dozen. This is a tribute to the many working students of UIC, and their faculty. May this good work continue.

AJSIII

## TABLE OF CONTENTS

CHAPTER		PAGE
1	<b>INTRODUCTION</b> .....	1
	1.1 The Scope of This Work. ....	1
	1.2 Why Pose the Question in this Manner? .....	3
	1.2.1 Questions of Equity .....	4
	1.2.2 Questions of Efficiency .....	5
	1.2.3 Questions of Perception .....	12
	1.2.3.1 The Search for Housing Policy Judgment .....	12
	1.2.3.2 Toward a Method of Inquiry .....	14
	1.2.4 Questions of Communication .....	15
	1.2.4.1 The Communicative Context of Public Action .....	15
	1.2.4.2 Housing Policy and the Place of the Mortgage Interest Deduction. ....	16
	1.2.4.3 The Lack of Effective Housing Policy Tools. ....	18
	1.2.4.4 A Climb Back toward Common Sense .....	18
2	<b>COMMON SENSE</b> .....	21
	2.1 Why Refute Common Sense? .....	21
	2.1.1 Herbert Simon's Rationality and the Need for Common Sense. ....	21
	2.1.2 The Falsification of Common Sense .....	22
	2.1.3 Just What Are We Refuting? .....	24
	2.2 What is Common Sense? .....	28
	2.2.1 Bernard Lonergan on Common Sense .....	31
	2.3 A Brief History of the Term Common Sense .....	34
	2.3.1 Common Sense as Common Knowledge .....	34
	2.3.2 Common Sense as Common Judgment .....	34
	2.3.3 Common Sense as Common Virtue .....	35
	2.3.4 Time to Catch Our Breath .....	36
	2.3.5 The Cumulative Nature of Common Sense .....	37
	2.3.6 Olson's Summary of Common Sense .....	38
	2.3.7 What We Have Just Tried To Do .....	39
	2.3.8 Kinds of Common Sense and Interdisciplinary Turf .....	40
	2.3.9 Common Sense and Propaganda .....	42
	2.3.10 Common Sense and Power .....	46
	2.3.11 Hoch's "Commonsense Pragmatic Metaphor" .....	46
	2.3.12 How Science Becomes Commonsense Proposition .....	48
	2.3.13 Wrap-up .....	50

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
3	<b>FORMALIZING COMMON SENSE</b> .....	52
	3.1 What is Formalized Common Sense? .....	52
	3.2 Formalizing Knowledge and Action .....	53
	3.3 The Context of Moral Certainty .....	57
	3.3.1 The Case for Hamiltonian Rationality .....	57
	3.3.2 A Constitution and Common Sense .....	58
	3.3.3 A Constitution is a Fact Impervious to Verbal Dissolution Alone .....	59
	3.4 The Public Context of Demonstrative Certainty .....	59
	3.4.1 The Tyranny of Butterflies .....	61
	3.4.2 The Siren Song of New Paradigms .....	62
	3.4.3 Some Models of Rationality. ....	63
	3.4.4 Some Origins of Rational Theories. ....	64
	3.4.5 Key Limits to Homo Economicus. ....	65
	3.4.6 Homo Economicus in Constitutional Context .....	66
	3.4.7 The Constitution Supercedes Scientific Paradigms in Public Life .....	68
	3.4.8 Why We Discuss These Things .....	70
	3.5 The Know-Do Matrix .....	70
	3.5.1 Rational Expectations -- Box One. ....	72
	3.5.1.1 RE Theory: The Rational Expectations Hypothesis. ....	73
	3.5.1.2 Rational Expectations Methods .....	74
	3.5.1.3 The Rational Expectations Policy Critique: RE Meets Common Sense. ....	75
	3.5.1.4 Rational Expectations Equilibrium: RE Bounded. ....	78
	3.5.1.5 The Commonsense Propositions of Rational Expectations .....	79
	3.5.2 Dumb Luck -- Box Two .....	79
	3.5.2.1 The Wisdom of the Masses Proposition: "Trust the People" .....	81
	3.5.2.2 The Invisible Hand/Chicago School Proposition: "Trust the Market" .....	82
	3.5.2.3 Formalizing the Common Sense of Milton Friedman's Position .....	83
	3.5.2.4 The Invisible Hand and Moral Certainty .....	83
	3.5.3 Akrasia -- Box Three .....	84
	3.5.3.1 Akrasia Defined .....	85
	3.5.3.2 The Augustinian Answer to the Rational Man .....	86
	3.5.3.3 An Akratic Commonsense Proposition--"Good" Can Lead to "Bad" .....	88
	3.5.3.4 Wagner on "Political Entrepreneurship" .....	89
	3.5.3.5 Planning as the "Sanitizer" of Dirty Politics .....	90

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
	3.5.3.6 Mr. Justice Holmes on the Law as a Bad Man .....	91
	3.5.3.7 Pragmatism and Common Sense. ....	91
	3.5.4 Chaos -- Box Four .....	92
	3.5.4.1 Mathematical Chaos .....	92
	3.5.4.2 Baumol and Benhabib on Mathematical Chaos in Economics .....	95
	3.5.4.3 Bounded Randomness or Deterministic Chaos? .....	96
	3.5.4.4 The Allure of Chaos for Planners .....	97
	3.5.4.5 Bounded Randomness and Common Sense .....	99
	3.5.4.6 Commonsense Propositions and Chaos .....	99
	3.5.5 Summary of Some Commonsense Propositions .....	100
	3.5.6 Bridge to Action: Technique and Story .....	100
	3.6 Conflicting Stories Built with the Same Commonsense Propositions .....	101
	3.6.1 Wrap-Up .....	103
<b>4</b>	<b>ACCUMULATED COMMON SENSE .....</b>	<b>105</b>
	4.1 Planning as the Applied Art of Formalized and Accumulated Common Sense .....	106
	4.1.1 Institutional Forgetting. ....	109
	4.1.2 Planning and Policy Analysis Can Provide Continuity and Context .....	111
	4.2 What "Common Sense Should Have Told Us" .....	112
	4.2.1 Searching to Find Out Which Side of Common Sense We Are On. ....	114
	4.2.2 Unintended Consequences .....	114
	4.2.3 Law as Accumulated Common Sense and Response to the Unintended .....	115
	4.2.4 Taking Stock .....	116
	4.3 How Planners Use Common Sense .....	116
	4.4 Local Regulation a Bridge Between Markets and Common Sense .....	118
	4.5 Planning Seeks in Policy Analysis the Demonstrative Certainty It Lacks .....	118
	4.5.1 The Young Herbert Simon and a Planning Problem .....	121
	4.5.2 Wrap-Up .....	123

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
5	<b>A METHOD FOR POLICY JUDGMENT-- CONVINCING OURSELVES</b> .....	125
	5.1 Common Sense within Qualitative Scientific Induction .....	126
	5.1.1 Catching Another Quick Breath .....	127
	5.2 A Method of Inquiry Leading to "Convincing Ourselves" Judgment .....	128
	5.2.1 The Post-Positivist, Constructivist Model Contrasted .....	130
	5.2.2 From Scientific Inquiry to Generic Knowledge .....	131
	5.2.3 Using the "Directions" for Argument .....	132
	5.3 Judgment in the Context of Common Sense .....	133
	5.3.1 Yves Simon on Judgment .....	133
	5.3.2 Gerald Suttles on the Reasoning of Land- Use Planners .....	134
	5.3.3 From Franklin to Deming: Examples from the Literature of Self-Help .....	134
	5.4 Commonsense Proposition as a Working Proxy for Judgment .....	136
	5.5 Adding Action "Directions" to the Know-Do Matrix in Action .....	136
	5.5.1 Incrementalism with a Twist .....	138
	5.6 Abduction and Research Programs .....	139
	5.6.1 Abduction Defined .....	140
	5.6.2 The Link Between Peirce and Refuting Common Sense .....	141
	5.6.3 Peirce's Varieties of Abduction .....	142
	5.6.4 Umberto Eco's Varieties of Abduction .....	142
	5.6.5 Blanco and Creative Abduction .....	143
	5.6.5.1 The Lack of Proof for Abduction .....	143
	5.6.6 Again Taking Stock .....	144
	5.7 Integrating Commonsense and Scientific Knowing in Policy Analysis .....	144
	5.8 On Sense and Common Sense in Public Policy Analysis. ....	146
	5.8.1 On Making Sense .....	146
	5.8.2 On Making Sense Common .....	146
	5.8.2.1 Live Versus Dead Facts. ....	146
	5.8.3 On Making Common Sense .....	147
	5.9 What We're Doing Here .....	147
	5.9.1 Peirce on Economy in Research .....	148
	5.10 Wrap-Up .....	149

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
6	<b>REFUTING COMMON SENSE--CONVINCING OTHERS</b> .....	150
	6.1 Refutation Defined .....	150
	6.1.1 It Isn't. ....	151
	6.1.2 It Doesn't .....	151
	6.1.3 It Can't .....	151
	6.1.4 It's Wrong .....	151
	6.1.5 Refutation Can Translate Common Sense to Science .....	151
	6.2 Common Sense as a Complex Form of Certainty .....	152
	6.3 Some "Postulates" of Common Sense .....	153
	6.4 The "Just War" Theory of Economics .....	154
	6.5 Whose Life Is It, Anyhow? .....	157
	6.5.1 A Caveat about Mental Schemata .....	159
	6.6 Formalizing Nonmarket Failure .....	159
	6.7 Science Moves Commonsense Propositions from One Box to Another. ....	161
	6.7.1 Box 2 -- Refuting "Trust the People" .....	162
	6.7.2 Refuting the Free Market .....	163
	6.7.3 Refuting the Commonsense Propositions of Rational Expectations .....	165
	6.7.4 Refuting Akratic Common Sense .....	166
	6.7.4.1 Emotions, Sales, and Market Rationality .....	167
	6.7.4.2 The "Circuit of the Senses" as an Aid to Rational Buying. ....	168
	6.7.4.3 The "Mae West" Decision Rule .....	170
	6.7.4.4 Buchanan's Commonsense Budget Proposal .....	171
	6.7.4.5 An "Akratic Cap" .....	171
	6.7.4.6 Refuting Akrasia Wrap-Up .....	172
	6.7.5 Refuting the Commonsense Propositions of Chaos .....	172
	6.7.5.1 Refuting Mathematical Chaos .....	172
	6.7.5.2 Refuting Commonsense Chaos .....	173
	6.8 The Need for "Generic" Formalized Common Sense .....	173
	6.9 When to Leave Common Sense Alone .....	173
	6.9.1 Wrap-Up .....	174
7	<b>HOUSING POLICY</b> .....	176
	7.1 The Complexity of Housing Policy .....	176
	7.2 Moral Mythology and Housing Policy .....	183
	7.2.1 The Myth of Self Determination. ....	183
	7.2.2 Real Estate as the Answer to Dr. Freud. ....	183



TABLE OF CONTENTS (continued)

CHAPTER		PAGE
7.3	Ideology and Story in Housing Policy . . . . .	185
7.3.1	An Economy of Housing Policy Research . . . . .	188
7.3.2	What We Just Did . . . . .	189
7.3.3	Retelling the Housing Policy Story . . . . .	189
7.3.4	Housing and Finance Policy Before World War I . . . . .	190
7.3.4.1	Federal Land, Local Governments. . . . .	190
7.3.4.2	Local Urban Blight and Reform . . . . .	192
7.3.4.3	Financial Industry Organizes . . . . .	192
7.3.4.4	Local Control and Local Initiative . . . . .	193
7.3.4.5	Progressive Era Federal Housing Studies . . . . .	194
7.3.4.6	Summary of Pre-World War I Housing Production. . . . .	194
7.3.5	Foundations of Housing Policy and the New Era, 1916-1933. . . . .	194
7.3.5.1	Wartime Housing . . . . .	194
7.3.5.2	Attempts at Local Public Housing . . . . .	196
7.3.5.3	Roaring Twenties Housing Boom. . . . .	197
7.3.5.4	Hoover Secretariat . . . . .	197
7.3.5.5	Hoover Presidency. . . . .	200
7.3.5.6	The Influence of Richard T. Ely . . . . .	204
7.3.5.7	Influence of the Financial Lobby . . . . .	204
7.3.6	Housing Policy From New Deal to the New World Order: A Summary . . . . .	205
7.3.6.1	New Deal Housing Policy Expansion, 1933-1949. . . . .	205
7.3.6.2	Home Owners' Loan Corporation . . . . .	205
7.3.6.3	Federal Housing Act of 1934 . . . . .	206
7.3.6.4	Federal Public Housing Efforts . . . . .	207
7.3.6.5	Financial Reforms . . . . .	208
7.3.6.6	Greenbelt Towns's Failure and Policy Effects . . . . .	209
7.3.6.7	The Housing Act of 1937 and Public Housing . . . . .	210
7.3.6.8	Wartime policy initiatives. . . . .	211
7.3.6.9	Truman: Toward the 1949 Act. . . . .	211
7.3.6.10	Summary of New Deal Housing Production. . . . .	213
7.3.6.11	Housing Policy Constructed . . . . .	213
7.3.6.12	Making Sense, Sense Common, and Common Sense about Housing Policy. . . . .	216
7.3.7	Tabular Summary of Major Federal Programs for Housing . . . . .	217
7.4	Housing Policy Stories Claiming Perceptual Certainty . . . . .	222
7.4.1	Central Versus Local Control of the Dough . . . . .	222

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
	7.4.1.1 "Funding Is Just Around the Corner" .....	223
	7.4.2 Terms Balloon Expands with Supply of Hot Air .....	224
	7.4.2.1 Banking Regulations. ....	224
	7.4.2.2 Tabular Summary of the Federal Liberalization of Housing Terms .....	227
	7.4.3 The Housing Policy Lottery .....	230
	7.4.4 Specialization Versus Generalization .....	230
	7.4.5 Market Interactions Change Policy Results .....	232
	7.4.5.1 Reagan Era Policies. ....	232
	7.4.5.2 They Just Fade Away .....	233
	7.4.5.3 Regional Nature of Housing Markets. ....	233
	7.4.6 Utopia Made Practical .....	239
	7.4.7 The Biggest Housing Policies Aren't Housing Policies .....	240
	7.4.7.1 Accelerated Depreciation and Rental Housing .....	240
	7.4.7.2 Effects of 1956 Highway Act. ....	240
	7.4.8 The Fourth Power Revisited .....	241
	7.4.9 Some "Generic" Housing Graphs .....	241
	7.5 Housing Policy Stories Claiming Moral and Perceptual Certainty .....	241
	7.5.1 The "Burden of Race" .....	241
	7.5.2 Let Housing Policy Be Housing Policy .....	244
	7.5.3 Bait and Tax .....	245
	7.5.4 "Trust the Market or the People?": from Rent Control to Vouchers .....	246
	7.5.5 The Low-Income Shall Inherit the HUD (But Not Yet) .....	247
	7.5.6 Who Really Benefitted From Housing and Urban Development Policy .....	248
	7.5.7 How to Rent While You Own .....	248
	7.6 Chapter Summary .....	251
<b>8</b>	<b>THE INQUIRY</b> .....	<b>252</b>
	8.1 How We Will Proceed and Why .....	252
	8.2 Ideological Context of the Mortgage Interest Deduction .....	255
	8.3 Structural Context of the Mortgage Interest Deduction .....	258
	8.4 Integrating Ideology and Structure: The Deduction's Pros and Cons .....	262
	8.4.1 Congressional Review of the Mortgage Interest Deduction. ....	262
	8.4.2 Downs's Position on the MID. ....	265

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
8.4.3	Pechman's Position on the MID. . . . .	266
8.4.4	Poterba on Housing and Tax Reform. . . . .	267
8.4.5	Andreassi and MacRae's Simulation of MID Reduction. . . . .	268
8.4.6	Pierce Hall on Equity and Homeowner Tax Preferences. . . . .	268
8.4.7	Congressional Budget Office and MID. . . . .	269
8.4.8	Summary of Controversies on the MID . . . . .	270
8.4.9	What to Watch for as We Consider . . . . .	271
8.5	Conflicting Mortgage Deduction Stories-- What's Wrong with It Now? . . . . .	271
8.5.1	Does the MID Decrease Business Investment? . . . . .	271
8.5.2	Does the MID Decrease Rental Housing Investment and Quality? . . . . .	271
8.5.2.1	A Look at Chaos in Housing Cycles . . . . .	272
8.5.2.2	Is There Chaos in Housing Markets? . . . . .	273
8.5.2.3	Graphing Chaos . . . . .	274
8.5.2.4	Phase Space Graphs of Selected Housing Cycles . . . . .	274
8.5.2.5	Graphing Single Versus Multi-Unit Housing Production . . . . .	291
8.5.2.6	Are Quantitative Tests for Chaos Helpful in This Case? . . . . .	297
8.5.2.6.1	The Lyapunov Exponent Test . . . . .	297
8.5.2.6.2	The Correlation Dimension Test . . . . .	298
8.5.2.7	Limitations in Economic Use of Present Quantitative Tests for Chaos . . . . .	299
8.5.2.7.1	Looking at Slopes in Phase Space . . . . .	300
8.5.2.8	Chaos in Housing Markets Wrap Up . . . . .	301
8.5.3	Does the MID Boost the Vacation Home Market? . . . . .	302
8.5.4	Does the MID Raise the Price of Housing Unnecessarily? . . . . .	302
8.5.4.1	Poterba's Models. . . . .	303
8.5.4.1.1	Poterba's Calibration . . . . .	307
8.5.4.2	The Question of Housing Market Elasticities . . . . .	314
8.5.4.2.1	Elasticity Wrap-Up . . . . .	324
8.5.4.2.2	Difficulty of Measurement of the Land Component . . . . .	324
8.5.5	Does the MID Drive Marginal Tax Rates Higher? . . . . .	324
8.5.6	Does the MID Increase Home Equity Lending? . . . . .	325

TABLE OF CONTENTS (continued)

CHAPTER		PAGE
	8.5.7 Does MID Allow More Homeowners to Itemize Deductions than Renters? .....	325
	8.5.8 Does the MID Benefit Primarily the Rich? .....	325
	8.5.9 Does the MID Increase New Construction? .....	326
	8.5.10 Does the MID Increase the Homeownership rate? .....	326
	8.5.11 Does the MID Encourage Overconsumption of Single-Family Housing? .....	327
	8.5.12 Does the MID Distribute Taxation over a Lifetime? .....	327
	8.5.13 Conflicting MID Stories Wrap-Up .....	337
	8.6 What Means Should be Used to Reduce It? .....	337
	8.6.1 The PLAM Option. ....	337
	8.6.2 The Redistribution Option. ....	338
	8.6.3 The Stay Put Option. ....	338
	8.6.4 The Trim MID Option .....	338
	8.7 My Proposal .....	341
	8.8 Have All Other Means Been Attempted? .....	342
	8.9 Is Our Remedy Proportionate to the Problems Caused by the MID? .....	342
	8.10 Will We Be Better Off Afterward? .....	342
	8.11 Chapter Summary .....	344
	8.12 And it Boils Down to... ..	347
9	<b>CONCLUSION</b> .....	349
	<b>APPENDICES</b> .....	355
	Appendix A .....	356
	Appendix B .....	437
	<b>CITED LITERATURE</b> .....	475
	<b>BIBLIOGRAPHY</b> .....	496
	<b>VITA</b> .....	502

**LIST OF TABLES**

<i>TABLE</i>		<i>PAGE</i>
I	BLANK KNOW-DO MATRIX .....	54
II	KNOW-DO MATRIX .....	71
III	KNOW-DO MATRIX -- RATIONAL EXPECTATIONS .....	73
IV	KNOW-DO MATRIX -- DUMB LUCK .....	80
V	MILTON FRIEDMAN'S "WHO SPENDS WHOSE MONEY" MATRIX .....	84
VI	KNOW-DO MATRIX -- AKRASIA .....	84
VII	KNOW-DO MATRIX -- CHAOS .....	92
VIII	SOME COMMONSENSE PROPOSITIONS .....	100
IX	KNOW-DO MATRIX REVISITED .....	137
X	THE "WHO SPENDS WHOSE LIFE" MATRIX .....	158
XI	MAJOR PARTICIPANTS AND INFLUENCES IN THE HOUSING MARKET .....	177
XII	OVERVIEW OF MAJOR FEDERAL PROGRAMS FOR DIRECT HOUSING ASSISTANCE .....	218
XIII	HISTORY OF CHANGES IN FEDERAL DEPOSIT INSURANCE PREMIUMS AND COVERAGE .....	225
XIV	SUMMARY OF FEDERAL LIBERALIZATION OF HOUSING TERMS .....	228
XV	FEDERAL HOUSING AGENCIES .....	231
XVI	HOMES OVER \$250,000 VERSUS ALL HOMES -- 1987 .....	317

## LIST OF FIGURES

<i>FIGURE</i>		<i>PAGE</i>
1	Percentage of Federal Transfers for Housing, 1987. ....	7
2	U.S. Private and Public Housing Starts, 1889-1988 .....	9
3	Federal Contingent Liabilities for Housing, 1987 .....	11
4	Certainty Propositions. ....	26
5	Definitions of Common Sense Associated with Complex Certainty .....	30
6	A Dynamic Interpretation of the "Three Certainties" .....	45
7	Seat of the Pants Builder, Apartment Starts, 1970-1983. ....	181
8	Seat of the Pants Builder, Single Starts, 1970-1983. ....	182
9	Annual Housing Construction in the United States, 1889-1920. ....	195
10	Housing Construction in the United States, 1915-1935. ....	198
11	Annual Housing Construction in the United States, 1930-1950. ....	214
12	Existing Home Sales by State, 1988 .....	234
13	New Privately Owned Units Authorized, 1987 .....	235
14	HUD Low Income Housing Assistance by State, 1988. ....	237
15	HUD Community Development Funding by State, 1988. ....	238
16	Annual Housing Construction in the United States, 1945-1969. ....	242
17	Annual Housing Construction in the United States, 1970-1987. ....	243
18	Graphic Test for Chaos: Housing Starts 1889-1988 .....	276
19	Annual Housing Starts in the United States, 1889-1989 .....	278
20	Graphic Test for Chaos: Housing Starts 1889-1945 .....	280

LIST OF FIGURES (continued)

<i>FIGURE</i>		<i>PAGE</i>
21	Graphic Test for Chaos: Housing Starts 1889-1915 .....	282
22	Graphic Test for Chaos: Housing Starts 1915-1945 .....	284
23	Graphic Test for Chaos: Housing Starts 1945-1985 .....	286
24	Graphic Test for Chaos: Housing Starts 1965-1985 .....	288
25	Graphic Test for Chaos: Housing Starts 1975-1985 .....	290
26	Multiple and Single Starts Contrasted, 1900-1988 .....	292
27	Multiple Starts in Phase Space, 1900-1988 .....	294
28	Single Starts in Phase Space, 1900-1988 .....	295
29	Poterba Rational Expectations Housing Equilibrium. ....	306
30	Poterba Model Graph I .....	308
31	Poterba Model Graph II .....	309
32	Poterba Model Graph III .....	310
33	Poterba Model Graph IV .....	311
34	Poterba Model Graph V .....	312
35	Poterba Model Graph VI .....	313
36	Mortgage Insurance and Guarantees Approved, 1970-1986 .....	319
37	Mortgage Insurance and Guarantee Applications, 1970-1986 .....	320
38	Theoretical Impact of a Subsidy to Homeowners. ....	331

## LIST OF ABBREVIATIONS

<b>BIF</b>	Bank Insurance Fund
<b>BMIR</b>	Below Market Interest Rate
<b>CBO</b>	Congressional Budget Office of the United States
<b>EHAP</b>	Experimental Housing Allowance Program
<b>FDIC</b>	Federal Deposit Insurance Corporation
<b>FHA</b>	Federal Housing Administration
<b>FHLBB</b>	Federal Home Loan Bank Board
<b>FHLMC</b>	Federal Home Loan Mortgage Corporation
<b>FIRREA</b>	Financial Institutions Reform, Recovery, and Enforcement Act of 1989
<b>FNMA</b>	Federal National Mortgage Association
<b>FPHA</b>	Federal Public Housing Authority
<b>FMR</b>	Fair Market Rent
<b>FSLIC</b>	Federal Savings and Loan Insurance Corporation
<b>GAO</b>	General Accounting Office
<b>GNMA</b>	Government National Mortgage Association
<b>GPO</b>	Government Printing Office
<b>HCDA</b>	Housing and Community Development Act of 1987
<b>HHFA</b>	Housing and Home Finance Administration
<b>HoDAG</b>	Housing Development Action Grants
<b>HOLC</b>	Home Owner's Loan Corporation
<b>HUD</b>	United States Department of Housing and Urban Development
<b>HUDS</b>	Harvard Urban Development Simulation Model
<b>HURRA</b>	Housing and Urban/Rural Recovery Act (HURRA) of 1983
<b>LTV</b>	Loan to Value



LIST OF ABBREVIATIONS (continued)

<b>MBA</b>	Mortgage Bankers Association
<b>MID</b>	Mortgage Interest Deduction
<b>MIT</b>	Massachusetts Institute of Technology
<b>MGIC</b>	Mortgage Guarantee Insurance Corporation
<b>NAHB</b>	National Association of Home Builders
<b>NAR</b>	National Association of Realtors
<b>NAREB</b>	National Association of Real Estate Brokers
<b>NBER</b>	National Bureau of Economic Research
<b>NHA</b>	National Housing Agency
<b>NIAS</b>	Netherlands Institute for Advanced Study in the Humanities and Social Sciences
<b>NIMBY</b>	Not in My Back Yard
<b>OBRA</b>	Omnibus Budget Reconciliation Act of 1987
<b>OED</b>	Oxford English Dictionary, Second Edition, 1989
<b>OLS</b>	Ordinary Least Squares
<b>OPM</b>	Other People's Money
<b>OSHA</b>	Occupational Health and Safety Administration
<b>PHA</b>	Public Housing Authority
<b>PL</b>	Public Law
<b>PLAM</b>	Price Level Adjusted Mortgage
<b>PPA</b>	Public Policy Analysis
<b>PVC</b>	Polyvinyl Chloride
<b>PWA</b>	Public Works Administration
<b>RE</b>	Rational Expectations
<b>REH</b>	Rational Expectations Hypothesis

LIST OF ABBREVIATIONS (continued)

<b>RFC</b>	Reconstruction Finance Corporation
<b>RTC</b>	Resolution Trust Corporation
<b>SAIF</b>	Savings Association Insurance Fund
<b>UIC-SUPP</b>	University of Illinois at Chicago School of Urban Planning and Policy
<b>USHC</b>	United States Housing Corporation
<b>USRA</b>	United States Resettlement Administration
<b>USSB</b>	United States Shipping Board
<b>VA</b>	Veteran's Administration
<b>WFC</b>	War Finance Corporation

## **SUMMARY**

This Dissertation situates a review of federal housing policy within a discussion of common sense, and focuses this discussion on the public policy issues involving the effects of changes in the homeowner's mortgage interest tax deduction. By considering questions relating to common sense, qualitative and quantitative induction, and certainty, it also begins to structure a rationale and method for the choice of appropriate policy analysis tools for this and related housing policy questions. Housing policy is examined in the context of chaos, akrasia, free market assumptions, and of rational expectations theory. Keywords: United States Housing Policy, Mortgage Interest Deduction, Common Sense, Chaos, Bounded Randomness, Abduction, Rational Expectations, Akrasia.

## Chapter 1

### INTRODUCTION

#### 1.1 The Scope of This Work.

The mortgage interest tax deduction for homeowners (MID) in the United States poses a number of complicated problems. Disinterested economists across the scientific and political spectrum, from Milton Friedman to John Kenneth Galbraith, have criticized it as inefficient and inequitable (Saunders, 1989, 119). Yet even the Mortgage Interest Deduction's critics agree that little change will be made in it due to its popularity among homeowners, who politically are legion.

Such a predicament is a common one facing policy analysts: a nagging problem exists for which proposed solutions have little political support and thus little likelihood of change, so the nagging problem continues. Some have called such problems "wicked" (Blanco, 1989, 261).

There exist at least four challenges to addressing these problems:

1. Barriers to effective inquiry into the truth of the problem, in this case, the effects of the Mortgage Interest Deduction.
2. The development of proposed improvements on the present situation (or, persuading ourselves).
3. Persuading others that the improvements will work.
4. Putting the improvements into action.

Many other obstacles lay in the way of effectively facing these four challenges.

This work attempts to understand obstacles standing in the way of effective public inquiry and action and seeks to overcome them by linking an analysis of common sense with an analysis of housing policy. By redefining common sense as a complex sense of certainty which we use to "get things done" in public policy, I develop an understanding of how we change our complex sense of certainty in order to change our policies.

Wicked problems must be addressed on many fronts until an opportunity for policy intervention presents itself. The response to wicked problems heretofore has been what I call "blind" incrementalism-- small, probing changes in public policy that resemble a random walk more than they resemble an heuristic search. What results from the following inquiry, however, is an incrementalism which is no longer "blind," but structured by a method of action springing from a method of inquiry. My hope is that by the end of this work my reader will have more reason and tools with which to seize policy opportunities than to stumble over them.

Standing in the way of such an inquiry and method are the obstacles of bias--professional, disciplinary, political, and social. These forms of bias can limit inquiry to areas acceptable to groups having vested interests in the forms of scrutiny used to answer public questions. Ideas--both new and old--can change markets and upset applecarts. But without fuller information, public options are limited.

To these ends, I propose herein methods of inquiry and of action that glean information from wide fields that stretch to the horizon of our knowledge. My method of inquiry is based upon a reinterpretation of common sense. I "formalize" this common sense into a tool which informs judgment in the four "challenge" and other areas listed above. I then use this "formalized common sense" to consider the question at hand, proposed changes in Mortgage Interest Deduction.

My principle assumption is that people will usually not change their minds or their actions unless their commonsense notion of the question at hand changes. This leads to two other questions:

1. What is common sense, and
2. How is it changed?

These two questions will take up a major portion of this work. Throughout, intellectual tools will be developed which:

- work to overcome barriers to inquiry,
- work to persuade ourselves,
- work to persuade others,
- work to place improvements into action.

To these ends, after our discussion of common sense and its modification, or "refutation," I will take up the question of the Mortgage Interest Deduction in detail. In doing so, I will interpret housing and tax policy in light of the notion of formalized common sense. Following this interpretation, I will consider policy proposals about the Mortgage Interest Deduction.

### 1.2 Why Pose the Question in this Manner?

From such an effort it is my hope that future scholars can create a better policy science, if one is possible, but at the very least a stronger and more useful storehouse of policy research from which policy analysis--public problem solving--can draw resources without stopping first to reinvent wheels or, as the poet e.e. cummings said, "mine" them (Cummings, 1968). I'm searching for tools from which only much later can we build rules--a substantially reasonable, systematic, and comprehensive approach as opposed to a piecemeal approach. Herein I attempt to delineate the limits of scientific and other knowledge pertaining to housing policy and to public policy in general.

Effective public action addresses questions of equity and of efficiency. Action is not possible without addressing questions of perception and communication. These latter questions are questions involving common sense.

#### 1.2.1 Questions of Equity

Persistent suffering among those highly visible among America's poor, both urban and rural, recent failures of savings and loans and the vast public investment necessary for their rescue, scandals at the United States Department of Housing and Urban Development (HUD), troubling problems of Congressional links with financial and development interests including misconduct, and weakened solvency within the Federal Housing Administration (FHA) and Veterans' Administration (VA) loan insurance systems indicate universal and fundamental problems with federal housing policies that "quick and dirty" expediency no longer can adequately address.

Fundamental problems require fundamental questions and fundamental understanding. But in the spirit of the late Chicago Mayor Harold Washington's aphorism, "HUD is not Mount Olympus," this work does not take a distant, olympian approach to housing policy. Its discussion builds on one key housing policy, the federal Mortgage Interest Tax Deduction for homeowners, or the Mortgage Interest Deduction (MID). In considering this housing policy, this work seeks insight into housing policies, their failures, and tools for their improvement.

In order to gain these insights, I had to try to solve one set of problems in order to "get at" other ones. The "one set" pertains to knowledge and action. The "other ones" encompass problems within the domain of United States Housing policy, requiring a retelling of key stories about housing policy. From this effort an overview and understanding result.

Such an overview and understanding is especially necessary today, for questions of equity persist regarding the housing needs of very low income households.

From 1977 to 1988 the total appropriated directly by the federal government on housing had been cut, in 1987 dollars, from over \$50 billion to under \$10 billion (Congressional Budget Office (CBO), 1988, 42). And while the total number of households directly receiving federal housing assistance rose from 3.2 million at the beginning of fiscal 1977 to 5.4 million at the beginning of 1988 (CBO, 1988, 37), the CBO, in tabulations of the 1985 American Housing Survey, estimated that 14.89 million very low income households were in need of some form of housing assistance in 1985, and that over 8.2 million households spent over 50% of their income on housing.

Shrinking federal dollars for housing are only part of the picture. Senior thinkers on housing policy (Downs, 1988; Lowry, 1989) have noted that federal housing funds, direct and indirect, are not given to needy very low income households to the degree possible, but primarily benefit urban constituencies--not necessarily very low income--in terms of direct aid, and middle and upper income families through tax benefits. George Sternlieb and David Listokin (1987, 36) went so far as to call federal low income efforts a lottery, "with a minority of the eligible getting a payout and the majority left out."

### 1.2.2 Questions of Efficiency

Even though federal dollars are theoretically spent more efficiently since federally-funded new construction has been cut--estimates state that at more than twice as many households can be assisted through direct housing (voucher) assistance than can be through public housing or new construction (CBO, 1988, 49)--according to CBO figures only a fraction of those needing housing assistance are getting it.

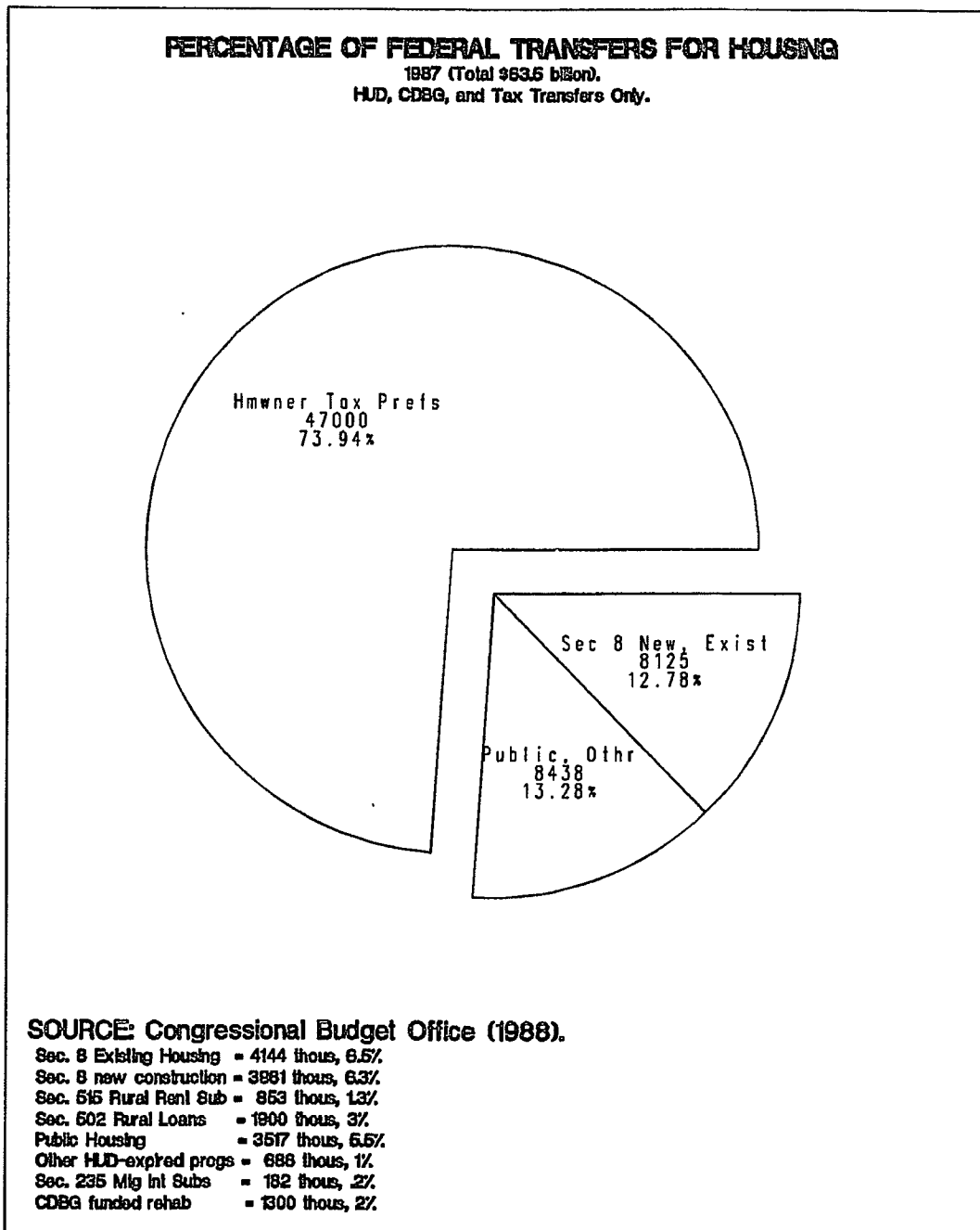
Just what size this fraction is remains under great dispute. Advocates of Housing Acts passed in 1990 (Stone, 1990) maintained that one third of America is housing poor. Debunkers of this position (Horowitz, 1990, 50), accuse those who speak of "housing crisis" of



exaggerating for political purposes. "Debunkers of the debunkers" point out that there is little housing crisis among homeowners precisely because of federal subsidies. Looming in the background of this debate are the large portions of public wealth represented by homeowner tax preferences.

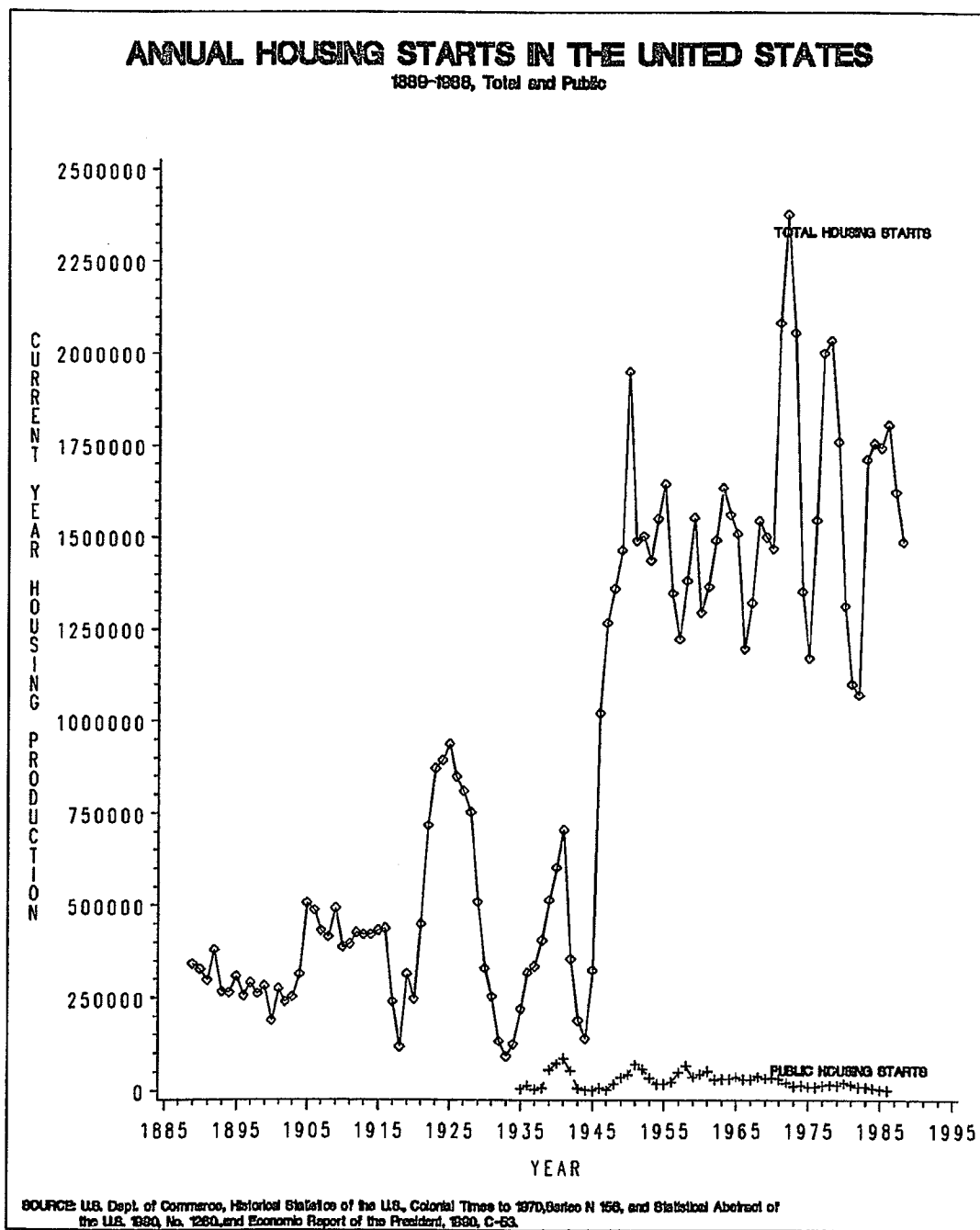
Homeowner tax preferences--deferred capital gains, the senior citizen capital gains exemption, the deductibility of state and local taxes and the MID--were estimated to total \$53.6 billion in 1989, with the latter two totalling over \$38 billion in current dollars (CBO, 1988, 4). The wealth transfer preference of the federal government is clearly weighted in the direction of homeowners over the needy in a proportion approaching three dollars to one as seen in Figure 1.

Figure 1. Percentage of Federal Transfers for Housing, 1987.



When laid out before the eye in Figure 2, the relatively small proportion of publicly constructed housing clearly shows the federal policy preference. Census figures for housing production over the past one hundred years tally over 89 million housing units produced, with less than 3 million of these units as public housing.

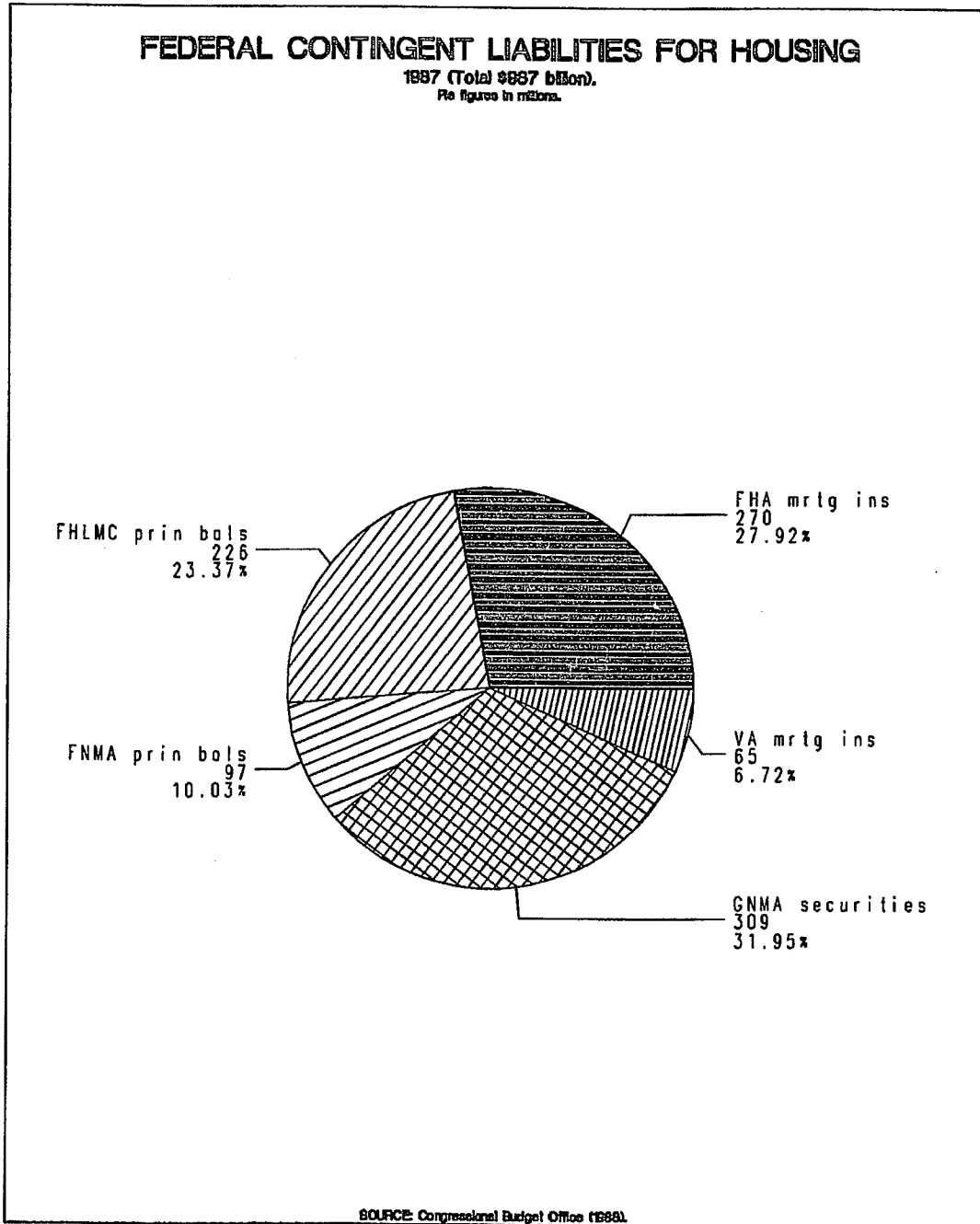
Figure 2. U.S. Private and Public Housing Starts, 1889-1988



In addition, the federal government has created a \$1 trillion safety net for housing, comprised of federally guaranteed mortgages, mortgage insurance, and mortgage instruments.

In recent years the "housing problem" has progressed from being viewed as a "decency" problem to an "affordability" problem to that of an "income" problem (Downs, 1988, 14). With the present questions about housing's safety net, it is clear that dweller income, while it ultimately drives the housing system, is heavily dependent on wealth added by government guarantees, as demonstrated by Figure 3.

Figure 3. Federal Contingent Liabilities for Housing, 1987



Considering the mess in housing finance attendant to the Savings and Loan crisis and the weakened position of the Federal Deposit Insurance Corporation (FDIC) requiring additional federal subsidies, the outlook for a federal housing policy which assists a greater portion of very low income and also needy senior households is bleak indeed.

In passing the Cranston-Gonzales Housing Act of 1990, which provides economic incentives for owners of buildings with expiring contracts for the provision of affordable housing to continue doing so, and which also increases federal outlays for new construction, Congress has been accused of making housing policy even less effective when it comes to the very low income dwellers in need of assistance. Despite the promise of this most recent Housing Act, it is doubtful whether it will ever even be substantially appropriated.

### 1.2.3 Questions of Perception

#### 1.2.3.1 The Search for Housing Policy Judgment

But these first few pages are not the place to argue this debate. Both the housing markets and housing policy have been accused of failure in recent years. If public policy begins where the market fails, what do we then do when policy fails? It might be time, paraphrasing Abe Lincoln, to disenthral ourselves and think anew.

The new thinking I here propose is merely an explicit form of old thinking. It chooses adequate tools for housing policy not out of mystic symmetry or professional rubric, but for utility. From this critical, bipartisan search for utility comes insight into the public planning, policy, and management tools that we use, and in their appropriateness for differing situations. These are the sets of problems I found myself trying to solve in order to get at other, specifically housing, ones.

This work is not so much about the search for a national econometric housing model but about how to make policy judgments in a housing market which redoubling in supply after Keynes, the postwar booms, and increased earnings of female workers (Carliner, 1988) remains chaotic in the commonsense usage of the term. Whether national housing markets are chaotic in the mathematical sense will be discussed here, and, while definitions of mathematical chaos may differ, some similarities to chaos, as Baumol (1989) describes it, are apparent.

Chaos or no, policies are either chosen, or else they might just "happen." The search for a method of policy judgment is the real story of this work, and the search will focus on a well-known policy proposal to limit the homeowners' Mortgage Interest Deduction in order to illustrate the case with a tangible policy application. It is useful to plant new ideas in familiar and well-cultivated ground.

Public judgment includes not only the judgment of citizens who vote, or of legislators who sometimes write laws, or of judges, or of public managers who implement and administer, but of analysts who, from the very beginning of their study, choose what is important to consider and what can be quickly discounted. While noting questions of citizen, legislative, judicial and executive judgment, this work considers especially analytical and planning judgment. How do planners and analysts "convince themselves"? What the planner or analyst recommends often shapes the future course of public inquiry and choice. What the analyst or planner emphasizes often remains emphasized, and what he or she overlooks sometimes everyone overlooks. What does the public planner or policy analyst need to know in order to make sound recommendations about housing policy, and what method does she or he use to make those recommendations? Herein I develop and propose such a method tailored to housing policy.



While we will not climb the late Mayor Washington's "Mt. Olympus", we must fix the vast edifice of housing policy itself in our gaze, and, even if not all of it can be addressed in a work of this size, some working general understanding of housing policy must be attempted.

#### 1.2.3.2 Toward a Method of Inquiry

To achieve such a general understanding, it is necessary to confront commonsense notions about housing policy that both stand in the way of and inform our general understanding. Public policy turns upon common sense because for better or worse common sense surrounds personal decisions, and personal decisions shape policy decisions and select policy tools. In order to understand public policy complexity, a complex sense of certainty must be developed. And in order to change complexity, this complex sense of certainty must also be changed. I therefore do not begin with one thinker and trace the lines of his or her arguments through the mess of policy. I began with the mess, and pull many lines out of the mess.

The Mortgage Interest Deduction is one loose strand extending out of the tangle of federal housing policy. What would happen if we pulled it? How many knots within the larger tangle would tighten? In the tradition of Aquinas, arguments and facts from all corners are grist for this mill.

Regarding the problem which I had chosen--the mortgage interest deduction--were I to follow the standard approach, my results would have the standard effect--little or nothing. Economic science only has the resources today (note, I do not say, "cannot") to sustain relatively limited judgments about public policy, and yet today, day and in and day out, comprehensive judgments are expected of us as citizens and of our public officials. In order to solve my problem I had to create a new way of thinking, really, to systematize an old way.

The insights contained herein provide a kernel for the integration of ideas from many corners of economic science and other disciplines. The actual integration of these ideas will take many lifetimes of work. So this work is written in the "middle" of the problem, the practical wisdom of public problem solving in the domain of housing policy. Because I am proposing something new about something old, in this case common sense, the entire exercise--from theory to practice--was unfortunately (from the point of view of time and effort spent as a doctoral candidate) necessary.

In reflecting on common sense I was able to organize disparate tools--the methods of rational expectations, housing econometric methods, chaos theory, and insights from philosophy--into a common framework.

This common framework I have attempted to keep as simple, transparent, and therefore, practical as possible. This practical element, because it is a practical element, makes the most sense when speaking of the matter at hand, and can only draw few insights from initial theoretical discussions, which, however, post important trail markers for our journey through a thicket of policy confounded by academic controversy and political polemic. Neither technical mysticism nor proclamations of political faith will suffice any more in housing policy.

In order to preserve this practical element, the reader and I should first jump right into the problem at hand, and then step back and begin to speak more clearly of the common sense of housing policy as we review its challenges.

#### 1.2.4 Questions of Communication

##### 1.2.4.1 The Communicative Context of Public Action

Public action is confounded by the very language which accompanies public action. Political language itself is charged in such a way that scientific judgments are distorted in the process of being translated into political options. It is useful here to consider interactions

within the policy environment of the Mortgage Interest Deduction and weaknesses in our scientific knowledge of housing policy.

#### 1.2.4.2 Housing Policy and the Place of the Mortgage Interest Deduction.

Two grand themes run throughout United States federal housing policy, and they are the themes of:

1. public financial support for individual home ownership, and of
2. direct public attempts to provide adequate housing to those lacking it.

It will be shown that the first and more general thematic, predominant in terms of public dollars committed to housing, was shaped in many ways by Herbert Hoover and his lieutenants and strengthened in degree but not in focus by subsequent administrations.

The subdominant and more specialized thematic of housing policy spending remains the attempted public provision of housing to targeted groups. This thematic, while it provides the bulk of housing legislation, springing as it did into federal law during the New Deal after a century of progressive ferment, is still today the weak force in housing policy--weak despite the efforts of thousands of lobbyists and activists. These must content themselves with hundreds of pages of legislation, sometimes never adequately appropriated.

Today, almost sixty years after the New Deal, the vision driving federal housing policy is still in many ways that of Herbert Hoover and of those who served the government in his day.

The Mortgage Interest Deduction stands with a foot in each of these two grand themes. It is the structural preference for home ownership hidden in the first income tax legislation. "Grandfathered in" before the long-term mortgage's importance, it is now the granddaddy of housing policies. It is one of the government's largest "transfers" of wealth. It is also accused of being public aid for the middle class. The MID is the policy, whether it changes or no, which embodies hopes, contradictions, and many of the debates of federal housing policy. It spans

the chasm across which proponents of generalism and specialism in housing policy (Marcuse, 1989) shout at one another. To the extent that it symbolizes privilege, it is subject to increased modification and taxation.

The MID splits the two main camps in the housing policy polemic, the "housing crisis" group and the "crisis debunker" group. One calls for compassion and increased spending, another calls for better focused spending, and argues in the long run that the latter is more compassionate. One calls for more building, another calls for less. One calls for self-determination while asking for increased federal grants and subsidies to build and rehabilitate, while another speaks of direct subsidies and speaks of increased self-determination through economic choice. One sees building as creative, even inspiring, another sees building as spending two to three dollars to build having the same effect as every one dollar that could be spent for direct subsidy. Each either exaggerates or underestimates the role of the MID.

This work seeks to draw together such opposing points of view into one larger whole, an integral vision or "wider rationality" that does not surrender to partisan distortions of either the Left or the Right. It explains, to a certain extent, why such distortions exist. It views these distortions from the perspective of a distinct working model that captures the arguments and selective evidence of both the Right and the Left into something else. The pressures to abandon this "something else" in favor of a partisan stand are tremendous. Cries of human solidarity and the symbols of progressive change-agency seem to stand on one end, while logic and the appearance of effective rational policy and long-term justice seem to stand upon the other. It is possible that neither is the case.

There is no abstract answer to this question. Because of the size and significance of the MID, at look at it from each--and more--points of view will give better answers. To

understand the Mortgage Interest Deduction, it is necessary to reconsider federal housing policy. And to understand federal housing policy, it is necessary to consider the Mortgage Interest Deduction.

#### 1.2.4.3 The Lack of Effective Housing Policy Tools.

In interpreting policy, tools are needed, but in housing policy, tools are still in development. Despite the efforts of some of our most esteemed scholars and institutions, it has long been the complaint of those who study housing policy that a reliable and comprehensive national econometric model of the housing sector does not exist (Downs, 1983, 62). In good times, forecasters will call the annual housing production figures in advance to within a few thousand, usually with the help of national surveys of the expectations and commitments of builders and realtors (National Association of Home Builders, 1991). But absent stable economic conditions and extensive surveys, such predictions pull the plow across the furrow when a question concerning the possible effects of a change in policy arises, and those surveyed, having vested interests in the matter of policy, predict cataclysmic, stupendous, and unprecedented disaster if some of their oxen stand to be gored.

Yet policy decisions must be made on a national level which affect the housing industry weekly, if not daily, by agencies like HUD or institutions like the Federal Reserve System, and some measure of the effects of these decisions must be attempted.

#### 1.2.4.4 A Climb Back toward Common Sense

Now that the reader and I have swum around within the problem for a while, let us climb out of our predicament to consider "at poolside," as it were, the intellectual tools, the method of inquiry, which I propose to use.

In this work, I attempt to examine the way we organize facts about housing policy and communicate them. As we collect and sift through facts in the process of inquiry, we begin to

weave together a story with which we communicate our facts. Once we decide what story we wish to tell based upon the facts at hand, we often find that we need different kinds of facts than those which led us to *tell* the story in the first place in order to *effectively* tell the story in the second place.

This thesis tries to identify this second group of facts, the "different kinds of facts" needed to tell a story of housing policy, and to structure an inquiry into housing policy which identifies a number of these "second facts" in advance.

What are the advantages of doing this? There are principally two:

1. Knowledge structured around the expected form of an answer allows us to ask ourselves in advance the expected form of the question, and thus save time;

Public policy analysts must cut corners in order to answer questions quickly because opportunities for public or government improvements come and go quickly. If public policy analysis can be prepared to give comprehensive answers quickly (for answers, whether accurate or comprehensive or no, will be given by someone), then chances of government actually obtaining useful and accurate advice from public policy analysis are increased. Ironically, one must spend a lot of time and effort to be prepared. Slow policy research on one's own time is what allows an analyst to offer quick policy analysis on someone else's.

By making more explicit the links between policy research and policy analysis through the medium of those complex forms of certainty which we commonly refer to as common sense as I have done here, this work seeks to pave a highway through which effective housing policy advice can be transported quickly.

2. By considering in advance both the questions of housing policy and their answers, then the incrementalism which we still may propose will resemble an heuristic search more

than a reaction to chance. This work began with my misgivings about the blindness of incrementalism. I will end this work still recommending incremental strategies of public policy, but with some twists. The twists involve:

- possessing a map in advance of incremental moves, and
- a continuous attempt to develop a set of decision rules for which moves to make.

When you have a map, and some basic rules, then even if you don't like the incremental game you are playing, you are prepared to move immediately to your preferred direction when opportunities present themselves.

Our received approach has been to ask a question, submit it to scientific falsification, and then to communicate the results. My approach situates this familiar approach within an even more familiar one, that manner of public discourse which attempts to appeal to those various, complex forms of certainty we call common sense.

## Chapter 2

### COMMON SENSE

Earlier I proposed that this work attempts to understand obstacles standing in the way of effective public inquiry and action and seeks to overcome them.

Herein I propose methods of inquiry and of action based upon a reinterpretation of common sense. I assume that common sense must be "refuted" and/or modified for a change to occur in policy without the use of force. I then "formalize" the resulting common sense into a tool which informs judgment. In order to do this, we must answer the questions:

1. Why refute common sense?
2. Just what are we refuting?
3. What is common sense?
4. How do we refute or modify common sense?

#### 2.1 Why Refute Common Sense?

##### 2.1.1 Herbert Simon's Rationality and the Need for Common Sense.

Few have influenced the fields of public policy and of planning recently as has Nobel Memorial Prize economist, psychologist, and computer scientist Herbert Simon. In the third edition of his landmark *Administrative Behavior*, Simon (1976, xxviii) stated, "Administrative theory is peculiarly the theory of intended and bounded rationality--of the behavior of human beings who *satisfice* because they have not the wits to *maximize*."

John Friedmann, in his overview of planning theory, summarized Simon's position:

A significant contribution to the problem of decision-making was Simon's notion that administrative rationality was "bounded." Decision makers, said Simon, could never be completely rational in the sense of having *total* knowledge of a situation and the alternatives available to them. In practice,



there were always limitations of time, resources, and intelligence. In practice, a person's knowledge of consequences was at best fragmentary and the alternatives examined always few. Under the circumstances, one had to make decisions the best one could. One had to select the course of action that would somehow manage to satisfy major organizational values. The pragmatic decision problem was rarely how to optimize one's values; to "satisfice" them was all that one could reasonably expect. One simply chose that course of action that appeared to be "good enough." And how did one know that it was good enough? Well, said Simon, "the first test, and perhaps not the least important, is the test of common sense" (H. Simon, 1976, xxx). (John Friedmann, 1987, 151)

The tone of Friedmann's subsequent remarks indicate his critical opinion of Simon's approach, misgivings which not a few planners share concerning Simon's ideas as they are used in the young field of public policy analysis and in public administration. John Friedmann saw in Simon's admission to a reliance on common sense a "comfortable and meaningless" decision rule which seemed to advise, "in the language of the social sciences, what everyone was doing anyway, that is, to somehow manage to get by" (John Friedmann, 1987, 151).

I do not share Friedmann's harsh assessment of Simon's position, especially Simon's admission that common sense plays a very important role in administrative decisions. On the contrary, common sense, and a better understanding of it, provide a bridge between the rationality of the market and social rationality, between reasonability and rationality, between public policy analysis and planning theory, between the social choice calculus of Pareto-style (Pareto, [1909] 1971) optimality and political choices, between the law as written and the law as implemented, and between the recommendations of planners and the choices of communities.

### 2.1.2 The Falsification of Common Sense

Social scientists are trained, following Popper, to falsify the null hypothesis, in other words, to prove that the negation of a hypothesis is not so: "It must be possible for an empirical scientific system to be refuted by experience" (Popper, 1968, 41). But this

falsification, while necessary for the scientific truth of the issue at hand, is not sufficient to insure that this scientific knowledge will persuade citizens or policy makers to change their actions. While scientifically derived knowledge might be true in a given case, it is, in effect, useless until others can be persuaded or tricked into accepting its truth and acting upon it. Non-scientific common sense must itself be refuted for scientific discoveries to be applied by citizens. Sometimes, scientific ideas embodied in a machine that "works" refutes the old common sense universally. As Ginger Rogers sang the Gershwin tune in *Shall We Dance*, "They all laughed when Edison recorded sound. . . . but, ho ho ho, who's got the last laugh now?"

Planners and policy analysts do not dramatically save lives with new pills or gadgets which by demonstrating their own usefulness refute their critics. While students of science, they are concerned primarily with its application in public choices. In order for scientifically derived knowledge to be translated into action, another test must be overcome, and that is that the common sense of citizens and policy makers must be clearly contradicted by persuasive presentation of scientific evidence when it is pertinent to public questions.

Administrators in particular tend not to move from common sense positions unless science clearly refutes common sense. This is especially difficult when the results of scientific inquiry produce counterintuitive findings. First, evidence must be proved scientifically. Second, this finding must be communicated effectively to citizens and policy makers in a persuasive manner. ***In public affairs, not only must scientific knowledge be falsifiable, but so also must common sense.***

Senator Sam Nunn, during the Senate Persian Gulf debates on January 12, 1991, made a telling off-hand remark which can be found in hundreds of others' comments throughout congressional hearing transcripts on any number of issues: "First, get the facts, then use

common sense." The specialist is expected to get the facts, and the policy actor or citizen is expected to decide based upon them. But how the specialist "gets the facts" shapes the choices which "common sense" decides. ***Unless "facts" refute "common sense," "common sense" decides based upon its own assumptions.***

The poet e.e. cummings, in his work, *Santa Claus* (1967), referred to scientists as "knowledge salesman." While cummings's intent was a satiric critique of the proprietary hoarding of knowledge by self-serving academics, the planner or policy analyst in order to be effective must actually be something of a good salesperson. George J. Stigler (1988, 215) mentioned "aggressive academic salesmanship" as a universal trait of theoretical innovators.

The refutation of common sense is also a two way street. It is frustrating for scientists to educate a public against misconceptions long disproved by research, to keep disproving the "conventional wisdom"--Galbraith's phrase, "old wive's tales," or "urban legends." But from time to time information comes from public quarters that actually informs the scientific process, or at the very least challenges the scientific process to refute it--effectively. The old jab at economists' fondness for abstract thinking, "It's all right in practice but it won't work in theory," cited by Stigler (1988, 87) as "tedious humor" and one of the common and "envious jibes" against economists might contain a grain of truth. There was a time when one rarely saw data analysis--or effective presentation--accompanying published economic or econometric theory.

### 2.1.3 Just What Are We Refuting?

When we "refute" common sense what do we refute? Generally, what is refuted is the complex sense of certainty about a fact or a course of action that a citizen or public official possesses. This sense of certainty is not simply based in scientific demonstration.

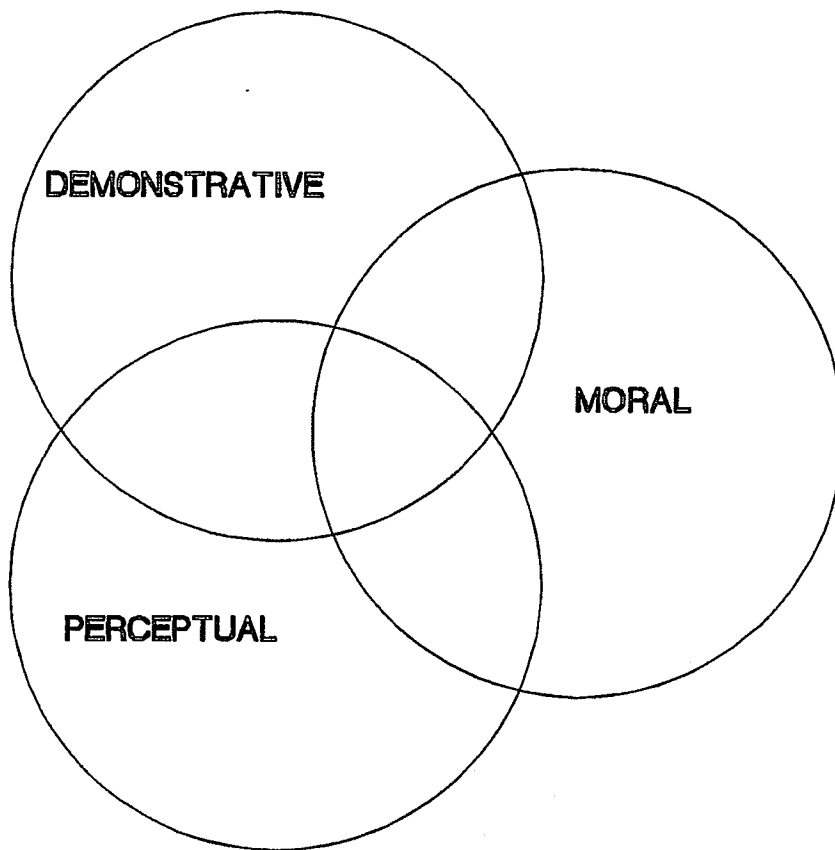
The great Swiss mathematician Leonhard Euler distinguished among three kinds of certainty, which John L. Casti summarized nicely:

1. *Perceptual certainty*: This is the type of certainty that comes from saying, "I saw it with my own eyes." Thus, certain knowledge of the perceptual type is exemplified by personal attendance at, say, a literary reading or a rock concert.
2. *Demonstrative certainty*: When you use the tools of deductive logic to prove the Pythagorean Theorem's claim about the relation among the lengths of the sides of the right triangle, you are gaining certain knowledge by virtue of demonstration. Thus demonstrative certainty, according to Euler, is what would be exemplified by our saying, "It's a logical certainty."
3. *Moral certainty*: Suppose I tell my students that Euler was a famous Swiss mathematician. Normally, students are gullible enough to believe me when I make statements of this kind, and so they leave the classroom with a third type of certain knowledge--the kind based upon what they've been told by others. This sort of knowledge is what Euler called morally certain. (Casti, 1990, 23).

Upon reflection, it can be seen that some statements can reflect not only one or the other such forms of certainty, but two or more. Economists have long noted the overlapping of certainty types. Milton Friedman ([1953] 1984, 3-46) used the famous example of the pool shark who behaves "as if" he knows the laws of physics, when in fact he might not. Economists have extended these "as if" arguments quite some distance, assuming that, for example, homebuyers behave "as if" they discounted the present value of the implied income stream from their home when in fact they might never have dreamed of such a thing. This "as if" reasoning, which involves the overlapping of the *demonstrative* certainty of the scientist with the *perceptual* certainty of the homeowner when both agree on the proposition, "Invest X dollars in house Y now," forms the basis for many of the insights of economics drawn from the "invisible hand" metaphor of Adam Smith ([1776] 1952), or from the assumptions of Rational Expectations. The possible "overlappings" of types of certainty possible for a given proposition are depicted in Figure 4.

Figure 4. Certainty Propositions.

**CERTAINTY PROPOSITIONS**  
With Euler Certainty Types  
and Overlapping Certainties



See Euler, 1761.

Looking into the matter further, we can observe that oftentimes *demonstrative* certainty is associated with science, *perceptual* certainty is associated with common sense, and *moral* certainty is associated with ideology, or, for our purposes, knowledge in action. Note however, the caution in the use of language here. I am not here saying that scientific = commonsense = moral certainty or any other permutation thereof. I am saying that it is possible for a *proposition* about a given course of action to have one or more kinds of certainty associated with it.

Planners and policy analysts have long dwelt within the "cracks" or "interstices"--the second term being the fond usage of the Chicago School of Sociology--between different institutions and disciplines. Now it is a little more likely to understand what goes on in these "cracks." I maintain that the accumulated wisdom of these professions can be interpreted in light of these professions using propositions having one or more kinds of certainty. In the following chapters these instances of intersection shall be considered in detail.

Planners and policy analysts have the daunting task of attempting solutions to public problems where differing forms of certainty not only overlap but might contradict one another. In order for the suggestions of analysts and planners to be enacted, differing strategies are necessary when confronting differing forms of certainty in order to "refute" the existing "common sense."

In "big" or "wicked" public problems like those posed by the Mortgage Interest Deduction, it is especially necessary to examine the landscape surrounding the problem.

When faced with a knotted mess like federal housing policy it is useful to go back to the beginning and reexamine one's assumptions. In this context, I propose to go back to the notion of common sense, especially since so many great thinkers have appealed to it, with little definition, in their innovations.

## 2.2 What is Common Sense?

Common sense has many definitions, and a review of these definitions will put a succinct working definition of common sense in its proper perspective.

Speaking of common sense is usually an elusive task. During the preparation of early drafts of his *Change Agent Skills* (1985, 1988a, 1988b) in the early 1970's, psychologist Gerard Egan was fond of beginning his discussion of common sense by first writing "common sense" on the blackboard, and then adding the prefix "un" to the word "common." It was Egan's contention that "common sense" was an oxymoron, and that, indeed, true common sense was a scarce commodity.

Can we make better sense of common sense? I propose to reinterpret our traditional definitions of common sense, as drawn from the Oxford English Dictionary, in the light of overlapping boundaries of *perceptual*, *demonstrative*, and *moral* certainty in Figure 4.

The Oxford English Dictionary contains four major definitions of common sense:

1. An 'internal' sense which was regarded as the common bond or centre of the five senses, in which the various impressions received were reduced to the unity of a common consciousness. . . .
2. The endowment of natural intelligence possessed by rational beings; ordinary, normal or average understanding; the plain wisdom which is everyone's inheritance. (This is 'common sense' at its minimum, without which one is foolish or insane.). . . . b. More emphatically: Good sound practical sense: combined tact and readiness in dealing with the every-day affairs of life: general sagacity. . . . c. Ordinary or untutored perception. . . .
3. The general sense, feeling or judgement (sic) of mankind, or of a community . . . .
4. *Philos.* The faculty of primary truths; 'the complement of those cognitions or convictions which we receive from nature; which all men therefore possess in common; and by which they test the truth of knowledge, and the morality of actions' (Hamilton *Reid's Wks.* II. 756). (Oxford English Dictionary, 1989, 573)

The great difficulty in addressing questions of common sense arises from confusion about which form of common sense we happen to be addressing at the time. So it is fitting in a work about formalizing common sense that the first formalizing done is of common sense itself.

If we look again at Figure 4, it becomes apparent that the areas where propositions possessing *perceptual* certainty intersect with *demonstrative* and *moral* certainty are unnamed, so let us give them names in Figure 5.

The most obvious name we can place on the Certainty Propositions graphic is that region where *perceptual* and *moral* certainty intersect. This region conforms to OED Definition Three, "the general sense, feeling, or judgement (sic) of mankind, or of a community." The Romans referred to this form of common sense as the *sensus communis*.

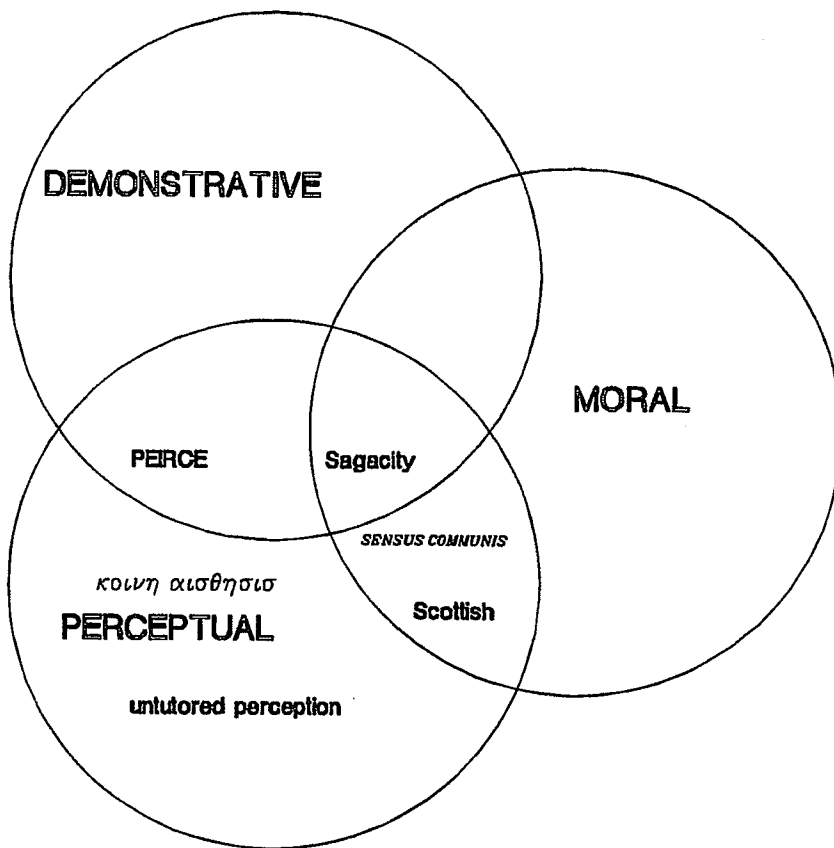
The great American philosopher Charles S. Peirce held that our "conceptions which are really products of logical reflections, without being readily seen to be so, mingle with our ordinary thoughts, and are frequently the causes of great confusion." "Common-sense," as Peirce called it, or "thought at it first emerges above the level of the narrowly practical" can be interpreted as this jumble of everyday thought and logical reflection (Peirce, [1877] 1968, 65). I locate Peirce's description of this form of common sense in the region of Figure 5 where *perceptual* and *demonstrative* intersect.

OED common sense definitions 3c and 1 both refer to the process of perception itself. Definition 3c, "untutored perception," belongs to that region of *perceptual* propositions intersected neither by *demonstrative* nor *moral*. OED Definition 1, the "internal" or "mediating" sense, the *κοινη αισθησις* of Aristotle, is related to the entire Perceptual region. The econometric literature has recently returned to the concept of *common knowledge* (Aumann, 1976; Nielson, et al., 1990) in an attempt to model what the epistemologists would call the background information to decision making.



Figure 5. Definitions of Common Sense Associated with Complex Certainty

**DEFINITIONS OF COMMON SENSE**  
 With Euler Certainty Types  
 and Overlapping Certainties



See Euler, 1761; OED, 1989.

The region of the "Certainty Propositions" graph where *perceptual*, *demonstrative*, and *moral* intersect is the region of OED definition 3b, "Good sound practical sense. . . . general sagacity."

I place the Scottish "Common Sense" philosophy of the 19th century, OED common sense definition 4, a definition assuming innate common sense, in that region of the graphic where *perceptual* and *moral* certainty propositions intersect, but not *demonstrative*.

In relating the OED definitions to Figure 5, I offer a quick way to sort through the confusion on definitions of common sense. I do not claim final philosophical accuracy in this exercise, and have not yet been able to obtain Helga Albersmeyer-Bingen's (1986) German-language dissertation on common sense, which just came to my attention. Indeed, a much longer philosophical work would be necessary for this. But as an aid to analysis and memory, such an exercise provides a useful organizational tool.

Why do I relate common sense only to the *perceptual* circle?

#### 2.2.1 Bernard Lonergan on Common Sense

My assumption about the perceptual nature of common sense springs from perhaps the most elegant and nuanced description of common sense in the literature:

Common sense, unlike the sciences, is a specialization of intelligence in the particular and the concrete. It is common without being general, for it consists in a set of insights that remains incomplete, until there is added at least one further insight into the situation at hand; and, once that situation has passed, the added insight is no longer relevant, so that common sense at once reverts to its normal state of incompleteness. . . . common sense, because it does not have to be articulate, can operate directly from its accumulated insights. . . . Proverbs are older far than principles and, like rules of grammar, they do not lose their validity because of their numerous exceptions. For they aim to express, not the scientist's rounded set of insights that either holds in every instance or in none at all, but the incomplete set of insights which is called upon in every concrete instance but becomes proximately relevant only after a good look around has resulted in the needed additional insights. Look before you leap! (Lonergan, [1958] 1978, 175-6)

Thus did the late Jesuit philosopher Bernard Lonergan approach the elusive topic of common sense. Elsewhere Lonergan (1971) held that the differentiation between common sense and science was made possible by Aristotle's key distinction between things as they relate to us and things as they relate to one another. Lonergan assigned things as they relate to us the meaning of common sense and things as they relate to each other the meaning of science (Lonergan, 1971, 17-18).

Lonergan's insights into common sense are so acute that I have assembled a number of them here:

1. There is a strategy in the accumulation of insights. . . .
2. There is a spontaneous accumulation of related insights. . . .
3. Teaching is the communication of insight. . . .
4. The spontaneous collaboration of individuals is also the communal development of intelligence in the family, the tribe, the nation, the race. . . .
5. Common sense, unlike the sciences, is a specialization of intelligence in the particular and the concrete. . . .
6. Common sense, on the other hand, never aspires to universally valid knowledge and it never attempts exhaustive communication. Its concern is concrete and particular. Its function is to master each situation as it arises. . . .
7. Common sense has no use for a technical language and no tendency towards a formal mode of speech. It agrees that one must say what one means and mean what one says. But its correspondence between saying and meaning is at once subtle and fluid. As the proverb has it, a wink is as good as a nod. . . .
8. Common sense not merely says what it means; it says it to some one; it begins by exploring the other fellow's intelligence; it advances by determining what further insights have to be communicated to him; it undertakes the communication, not as an exercise in formal logic, but as a work of art; and it has at its disposal not merely all the resources of language but also the support of modulated tone and changing volume, the eloquence of facial expression, the emphasis of gestures,

the effectiveness of pauses, the suggestiveness of questions, the significance of omissions. . . .

9. The only interpreter of common-sense utterances is common sense. . . .
10. Such a procedure, clearly, is logical, if by 'logical' you mean 'intelligent and reasonable'. With equal clearness, such a procedure is not logical, if by 'logical' you mean conformity to a set of general rules valid in every instance of a defined range; for no set of general rules can keep pace with the resourcefulness of intelligence in its adaptations to the possibilities and exigencies of concrete tasks of self-communication. (Lonergan, [1958] 1978, 173-178)

Lonergan concerned himself especially with the relationship between science and common sense, and devoted a section of his already cited work *Insight* to the bias of common sense:

Every specialist runs the risk of turning his specialty into a bias by failing to recognize and appreciate the significance of other fields. Common sense almost invariably makes that mistake; for it is incapable of analyzing itself, incapable of making the discovery that it too is a specialized development of human knowledge, incapable of coming to grasp that its peculiar danger is to extend its legitimate concern for the concrete and the immediately practical into disregard of larger issues and indifference to long-term results. . . .

So far from granting common sense a hegemony in practical affairs, the foregoing analysis leads to the strange conclusion that common sense has to aim at being subordinated to a human science that is concerned, to adapt a phrase from Marx, not only with knowing history but also with directing it. For common sense is unequal to the task of thinking on the level of history. (Lonergan, [1958] 1978, 226-227)

Indeed, common sense is a special "middle" form of knowledge, tied to the "particular and concrete," but unable to sustain itself over the "long haul," as it were. For the "long haul," we need something more than common sense. This "something more" calls to mind science, but we don't always have the luxury of a scientific answer to our public problems. Let us continue our reflections on common sense, for they will bring us to the threshold of this "something else." Another approach is to look at the at how the concept of common sense changed throughout history.

### 2.3 A Brief History of the Term Common Sense

The term "common sense" can be viewed as gathering intellectual barnacles as it has steamed through history. The themes of common sense as common knowledge, as common judgment, and as common virtue are prominent among the barnacles.

#### 2.3.1 Common Sense as Common Knowledge

Common sense as common knowledge has both individual and social connotations.

According to Sir W. Hamilton in 1872, Aristotle defined *κοινη αισθησις* as "the faculty in which the various reports of the several senses are reduced to the unity of common apperception" (Oxford English Dictionary, 1989, 573).

The Roman usage of the term *sensus communis* denoted a sense of common public knowledge, according to Hans-Georg Gadamer, who then traced this concept down to the Scottish "Common Sense" philosophers of the early 19th Century, who proposed a common sense guiding the "common affairs of life," as opposed to an impractical metaphysical reasoning, a "moon-sickness" (Gadamer, 1988, 25). Significantly, the OED finds the use of "common wit" prevalent until 1509, with the phrase "common sense" appearing in English letters during the Renaissance.

Over the centuries there has been something like "intellectual inflation" at work, and the notion of *sensus communis* grew from individual perception to public knowledge to rational judgment to ultimately, public virtue.

#### 2.3.2 Common Sense as Common Judgment

The classicist S.E.W. Bugter (1987, 94-95) held that Cicero had made no strong connection in *sensus communis* between common notions and the sense of rational judgment which was to come. The sociologist Fritz van Holthoon (1987, 100-101) saw in Aquinas a shift in the meaning of the phrase to discerning judgment, and saw growing use of this

understanding in "Erasmus, Descartes, Vico, Hutcheson, Shaftesbury, Voltaire, Hume, Fenelon, Reid and many others." Common sense transformed into Moral Sense by Hutcheson heavily influenced Adam Smith's moral philosophy (van Holthoon, 1987, 103). Peter J. van Kessel (1987, 115) traced its influence in Bacon and Vico as well, and van Holthoon (1987, 151) did so for Rousseau.

Because of class and negative connotations about the word "common", the Enlightenment, not quite that enlightened, did not use the term in our sense of "ordinary," but thought it to mean "rude," according to the OED (1989).

The OED also notes a use of the phrase "common sense" by Swift, in Drapier's letter II of 1724:

Should he not first in common sense, in common equity, and common manners have consulted the principal party concerned? (OED, 1989)

But by the time of Thomas Paine, *Common Sense* [1776] meant something else indeed.

### 2.3.3 Common Sense as Common Virtue

To a degree for the *sensus communis* before Paine, but especially for common sense after Paine, it has been customary to invest common sense with the aspects of a virtue. Because of the "virtuous" overtones now ringing in the phrase "common sense," the concept of common sense has developed, in a way, a life of its own distinct from the term common sense. Like God, common sense was then called upon to fill gaps in intellectual systems, and philosophers seeking scientific certainty lashed out at common sense.

When the philosophers of the late Eighteenth and the Nineteenth century attacked common sense they did so from the context of seeking to separate scientific knowing from the many revolutionary and extreme ideologies of the day. Hegel spoke of the limitations of common sense:

On the other hand the natural way of philosophizing, running in the tranquil river bed of common sense, presents a rhetoric of truisms as truths (Hegel, 1981, 64; van Holthoon, 1987, 111)

And, by van Holthoon's account:

Stuart Mill, as the representative of scientific positivism, wrote to a correspondent in 1872 that the view that commonsense judgment cannot be tested by reference to experience (Reid's point of view) is false, and will lead to a "judgment by superficial appearances. . . . Almost all false political economy, for instance, is made of judgments by common sense." (Mill 1972, 1868-1869; van Holthoon, 1987, 111)

After Hegel and Mill, common sense went "underground", according to Van Holthoon (1987, 111), to be resurrected by Peirce, Moore, Gramsci, Bergson, and Gadamer.

Modern thinking has gone a step further. In a time-transfer so typical of language, Biblical translators now use the modern phrase "common sense" to render an ancient passage in Paul's Letter to Titus (2:6-8), to render the *Koine* (common!) Greek word *sophronein* as "to use common sense; to be in one's right mind" (Quinn, 1990, 304-305):

Encourage the young men, similarly, to use common sense in all matters (given that you proffer yourself as a pattern in fine deeds; openhanded with the instruction; a reverent man, wholesome in preaching, irreproachable, so that the opponent, able to muster nothing bad to say about us, will be embarrassed) (Quinn, 1990, 27).

We have thus transferred to common sense a certain Biblical aspect of prudent good judgment. It has become not merely a quality but a virtue. It is not surprising that this apotheosis of common sense has followed down from a propaganda tract entitled *Common Sense*. Where common sense is publicly invoked, common propaganda is not far behind.

#### 2.3.4 Time to Catch Our Breath

But before we consider the question of propaganda, key to the notion of refuting common sense, we need to review and focus the discussion.

My interpretation of common sense so far involves the key suggestion that it is based in immediate sense perception--perception of ourselves, our predicament, and of our perception of our own local mores. Those *demonstrative* propositions which intersect with our *perceptual* propositions are usually things we can "see for ourselves," because "Seeing is believing." Those propositions possessing *perceptual* certainty which share a *moral* certainty have in some form been enhanced by "social permission" granted from a group to which one belongs, from whom "A word to the wise is sufficient." Those propositions possessing *perceptual*, *demonstrative*, and *moral* certainty have the "nature of a command" (Yves Simon, [1961] 1988, 386). They tend to be acted upon.

#### 2.3.5 The Cumulative Nature of Common Sense

Planners and policy analysts draw upon key aspects of common sense. One is its cumulative nature.

This cumulative aspect Lonergan addressed, but the philosopher of hermeneutics, Hans-Georg Gadamer (1990) has been more specific. He related the *sensus communis* to the practice of late Roman legal science, the "art and practice" of which "is closer to the practical ideal of *phronesis* [practical knowledge] than to the theoretical ideal of *sophia* [theoretical knowledge]."

The august rhetorician Cicero, in his *De Oratore*, held, according to Gadamer (1990, 23-24), that

*Historia* is a source of truth totally different from theoretical reason. This is what Cicero meant when he called it the *vita memoriae*. It exists in its own right because human passions cannot be governed by the universal prescriptions of reason. In this sphere one needs, rather, convincing examples as only history can offer them. That is why Bacon describes *historia*, which supplies these examples, as virtually another way of philosophizing (*alia ratio philosophandi*). (Gadamer, 1990, 20)



The *sensus communis* of Cicero and his heirs conveyed the idea of a common cultural and historical wisdom, a public sense of context.

Early in his discussion of the *sensus communis*, Gadamer (1990,18) referred to the conflict between rhetoric and philosophy. Gadamer noted that the "positive ambiguity of the rhetorical ideal" was condemned not only by Plato, "but by the anti-rhetorical methodology of modern times."

In so doing Gadamer put his finger on two of the important intellectual traditions underlying the periodic conflict between social science and policy analysis:

1. Over the past two decades, because policy analysts have recognized that effective communication of policy recommendations is crucial to effective policy implementation, policy analysts have tapped into the study of rhetoric, and have contributed to the rhetorical literature (Majone, 1989). It is easy to confuse rhetorical argument with scientific logic.
2. The "positive ambiguity" of which Gadamer wrote is an important aspect of common sense reasoning, and shall be considered further in the discussion following psychologist David R. Olson's summary of aspects of common sense.

#### 2.3.6 Olson's Summary of Common Sense

It is perhaps because of the power, both to integrate and to mislead, of the idea of common sense that an international conference on common sense was sponsored by the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS), published in 1987 as *Common Sense -- The Foundations for Social Science*.

Drawing together themes of the conference, psychologist David R. Olson summarized several attributes of common sense also from Dewey (1938), Lonergan ([1958] 1978), and Schutz and Luckmann (1973):

1. "First, it is tied to the particular and concrete. Each experienced event is situated in a particular context and commonsense knowledge reflects the uniqueness and context dependence of those events. It is therefore low in principled generalizability. . . .
2. Secondly, commonsense generalizations, reflecting the variability of events, are coded in a loose metaphorical way rather than in terms of the explicit, exhaustive principles which are the goal of any science.
3. Third, common sense preserves elements of knowledge which are not in complete agreement with each other . . . .
4. Fourth, commonsense thinking operates by illustration and example, not by formal rules and definitions.
5. Fifth, common sense is value laden. Any aspect of knowledge is marked for significance such that, forced to choose, the man of common sense knows to put 'First things first.'
6. Sixth, commonsense arguments are won, not necessarily by the person having the best reasons but by the one who has 'the last word'" (Olson, 1987, 330-331).

Olson (1987, 331-332) then discussed implications for education, and how those who do not address the common sense of children do not communicate effectively with them. The political implications, that one must address the common sense of one's audience, are obvious.

It is Olson's third notion of common sense, reminiscent as it is of Gadamer's mention of "positive ambiguity" of rhetoric earlier noted--the notion that common sense entertains several possibilities not in agreement with one another, which is a key to my argument on the necessity to refute common sense in public policy, while at the same time drawing from common sense what is useful.

### 2.3.7 What We Have Just Tried To Do

From the previous exposition we can derive a description of common sense as a class of personal knowledge which tends to be particular, concrete, sensory, metaphorical,

analogical, contradictory, aphoristic, value laden, rhetorical, and associated with work and place. At its most essential it provides the necessary personal codes for effective choice and action. At its worst it prevents a more comprehensive understanding from being achieved or enacted. Today, the term common sense contains overtones of common knowledge, common judgment, and common virtue.

It is my contention that we use the words "common sense" to describe a whole class of reasoning processes as well as reasoning strategies which we use in practical everyday affairs. By common sense I think we usually mean, **a complex sense of certainty which we use to get things done**

Analogously, common sense represents the "expert systems" of individual human beings who know how to do their particular jobs and make decisions within their own particular predicaments. As expert, personal knowledge pertaining to one's own personal predicament, it can indeed be uncommon.

It is thus possible to model some forms of personal common sense with computer algorithms in some cases, and to build systems of such expert personal systems. Whether the *moral certainty* dimension of common sense can ever be modeled is the subject of much science fiction.

As a class containing several kinds of knowledge as expressed by the overlapping certainty propositions of Figure 5, common sense can be used to solve problems. But because of its slippery nature, we have to be very careful which "segment" of the Certainty Circle map we are moving within, and which "direction" we are moving.

### 2.3.8 Kinds of Common Sense and Interdisciplinary Turf

It is understandable that each discipline of public problem solving, whether policy analysis, planning, or management, would claim as its own the section of the Certainty Circle

map where certainty propositions share three kinds of certainty. And, of course, each applied public discipline deals with all forms of certainty and common sense. This does not mean, however, that each discipline does not "favor" certain kinds of certainty and common sense.

Planning, in my opinion, tends to rely more on the *sensus communis* and *historia*, shared accumulated wisdom. In fact, I view planning as the *applied art of formalized, accumulated common sense*.

Policy analysis tends to put forth propositions from the section where *perceptual* and *demonstrative* certainty intersect.

Management, of course, seeks to claim all three forms of certainty, but opinions differ as to management's success.

In this regard, Professor Gerard Egan's definition of common sense is apt: "making prudent and effective decisions, taking all relevant factors into context--social, emotional, political, and cultural" (Egan, personal communication, 1/22/1990). His definition is a "three certainty" definition of common sense. Our conversation also produced a joint description of common sense in action: "prudent and effective judgment and decisions in a topsy turvy world."

But what of the segment where *moral* and *demonstrative* certainty intersect? The segment represents propositions possessing *moral* and *demonstrative* certainty. If a social scientist polls a population for moral opinions such as those pertaining to war or abortion or a particular candidate, and seeks to imbue these findings also with a demonstrative certainty, then this social scientist or pollster is engaging in ideological research. When this information, already possessing some degree of *moral* and *demonstrative* certainty, is presented graphically or metaphorically, and is thus "translated" into *perceptual* certainty, then this applied ideological research becomes propaganda. This propaganda, whether for good or no, can be used to modify or replace previously existing common sense.

The French philosopher Paul Ricoeur (1986, xxvii) distinguished between "integrative" and "distortive" ideologies, ideologies which synthesize or ideologies which deceive, and how an ideology which first integrates can later distort. The mathematician Ivar Ekeland said something similar of "pictures" used to convey scientific truth:

The power of certain pictures. . . . is a power, in the early stages, to initiate progress, when the ideas it conveys are still creative and successful, and it becomes, later on, a power to obstruct, when the momentum is gone and repetition of old theories prevents the emergence of new ideas. (Ekeland, 1988, 9)

Now the use of the word "propaganda" in this regard may not please those who engage in opinion-shaping research, who might prefer to term their pursuit "political action." But I prefer to use the word, because it is a constant reminder of the dangers of molding opinion, even when it founds something as precious as democracy.

### 2.3.9 Common Sense and Propaganda

Paine's *Common Sense* had more propaganda than it did common sense. The common sense of *Common Sense* was the argument of local knowledge, that we here can govern ourselves better than can those thousands of miles away, an idea readily understood. His economic and military arguments were not as persuasive (Kramnick, 1976, 44). Paine attempted informed common sense. There is not much distance between informed common sense and shaped common sense, of which propaganda is composed.

That common sense could be shaped was noticed even during this year of 1776 by Adam Smith:

In every country, it always is and must be the interest of the great body of the people to buy whatever they want of those who sell it cheapest. The proposition is so very manifest, that it seems ridiculous to take any pains to prove it; nor could it ever have been called in question, had not the interested sophistry of merchants and manufacturers confounded the common sense of mankind. Their interest is, in this respect, directly opposite to that of the great body of the people. (Smith, [1776] 1952, 458)

Note Smith's understanding of "sophistry" here. "Sophistry" "confounds" "common sense."

The language of common sense recomposed is the raw material of propaganda. Propaganda charades as common sense when its *sense* has no longer become *common* but seeks to become so. Effective propaganda tends to drive out previous common sense.

The ambiguity of the term common sense has indeed made it a potent tool of propaganda, which in a way strips the *sense*, in this case personal judgment, from the *common*, emphasizing the *common*. The foremost student of propaganda, Jacques Ellul (1965, 169), has noted the key role of such alienation--manipulating someone to be other than oneself--in propaganda. The overtones of virtue in the term common sense, when coupled with its ambiguity, have led to its misuse in propaganda.

The ancient Aristotelian (1955) list of fallacious arguments included *ad populum*, the appeal to the mob. The frequency of the use of the term common sense in political stump speeches indicates that not only is the term itself a tool of propaganda, but that the modification of the common sense of the crowd by the very term common sense itself allows the propagandizer to create a system of linguistic smoke and mirrors, wherein each listener is hearing different meanings which appeal to him or herself, but meanings which are particular to each listener. Each hears a different meaning, yet applauds the same words. The crowd shares in seeming unanimity about meanings which are really different. To coin a term, the term common sense is *autopoetic*, it creates its own meanings because it appeals to each person's individual predicament and world view.

In his popularization, *Free to Choose*, Milton Friedman spoke of the process of turning "preferences into convictions":

Anyone who is persuaded in one evening (or even ten one-hour evenings) is not really persuaded. He can be converted by the next person of opposite views with whom he spends an evening. The only person who can truly persuade you is yourself. You must turn the issues over in your mind at leisure, consider the many arguments, let them simmer, and after a long time turn your preferences into convictions. (Friedman, 1980, xii)

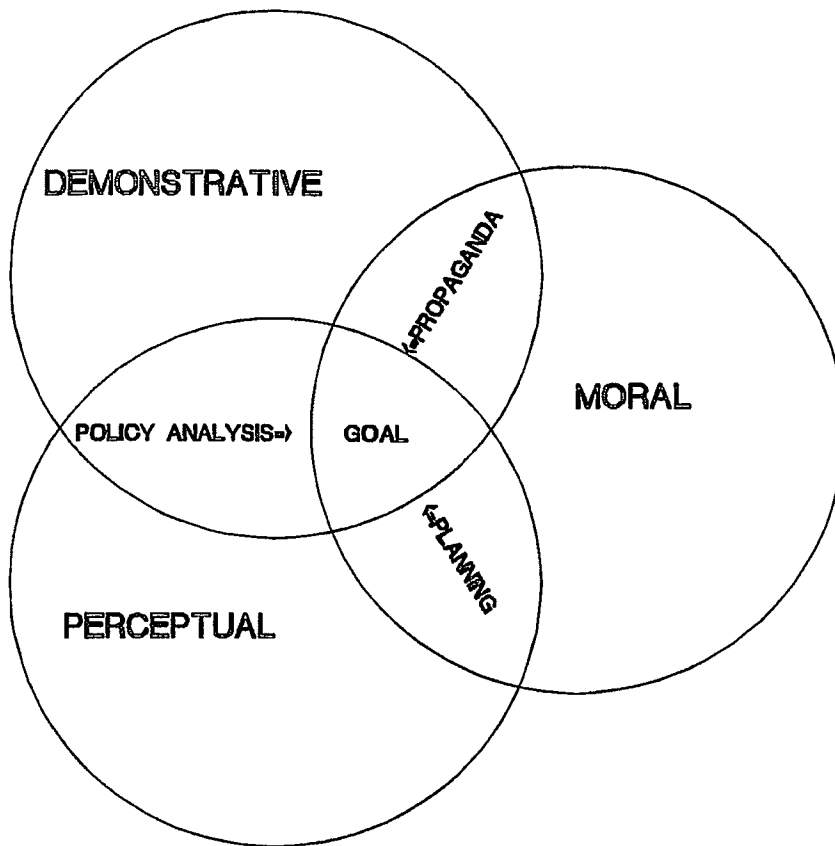
The thinker can consciously turn his or her preferences into "convictions." Otherwise, in my terminology, they become "commonsense propositions."

We now offer a dynamic interpretation of the Certainty Circle Map. Planning attempts to move from the intersection of *perceptual* and *moral* certainty toward the region of the "three certainties." Policy analysis seeks to move from the intersection of *perceptual* and *demonstrative* certainty toward the "three certainties." Propagandists seek to move from the intersection of *moral* and *demonstrative* certainty to the "three certainties." Management seeks to move to the "three certainties" by whatever path and remain there from whatever region the task has begun.

Figure 6. A Dynamic Interpretation of the "Three Certainties"

## SEEKING THE THREE CERTAINTIES

With Euler Certainty Types  
and Overlapping Certainties



See Euler, 1761.



Now, of course, this view is oversimplified, as any dynamic model is. But one thing is "certain" here, and that is each discipline involved in public problem solving would prefer to have the "three certainties" on their side.

What happens when they do not, as they often do in situations of power or conflict?

#### 2.3.10 Common Sense and Power

The idea that the "three certainties" alone are sufficient for public action is a naive one. Earlier I mentioned "physical, political, and economic coercion." One way of looking at power is that it creates and fills vacuums of certainty. Physical coercion, the unhappy rule in many places rather than the exception, substitutes for the "three certainties" as the "one certainty," a perceptual certainty, to act. Political coercion, as the direct limitation of economic, information, and other options, can substitute for one or more form of certainty. And as for economic coercion, Milton Friedman's explanation, that economic forces provide an impetus to act that information alone does not, underscores the power of economic coercion if it is used by one against another. The power of economic necessity is perceived even in the absence of coercion. Certainty alone does not bring us to act, we have to *want* to act.

#### 2.3.11 Hoch's "Commonsense Pragmatic Metaphor"

Charles Hoch has explored the relationship between planning and power on his writings from the pragmatic perspective, and has observed how forms of rationality themselves compete and conflict (Hoch, 1982a, 1982b, 1984, 1988a, 1988b, 1989, 1990). The early formulations of what has grown into Hoch's body of theoretical work were presented during our University of Illinois at Chicago School of Urban Planning and Policy (UIC-SUPP) Public Policy Analysis seminars in the early 1980's.

Professional planners as role players, according to Hoch, attempt to accommodate instrumental social effects and assimilate the experience of association between performers and audience. In practice, however, planners within bureaucratic roles are often "prevented from assimilating the experience of expressive association," and they "must accommodate the experience" of their own performance instead of assimilating. Within this context, long range planners settle for being right (technical competence), while short range planners focus on doing good (political/moral quality). These practical interests define the scope of roles to be performed. "To seriously theorize about integrating what is essentially separate in my day to day experience appears at first thought irrelevant, even utopian, yet upon deeper reflection may constitute a threat" (Hoch, 1982a). Note here, parenthetically, the clash of the rhetorical and the philosophical traditions in being right and doing good.

What has arisen in the profession, according to Hoch, is a *commonsense pragmatic metaphor* which "mediates the indignities of a frustrating bureaucratic job and aspirations for self-fulfillment as a professional" (Hoch, 1982a).

In understanding Hoch's point on the *commonsense pragmatic metaphor*, I find it useful to distinguish between "little" metaphors, like calling a planning presentation a "dog and pony show," and "big" metaphors like key personal self-images--from calling one's workplace "Plans R Us" or "Policy Hut" to the idea of a profession. It seems that Hoch not only referred primarily to the latter "big" metaphors, but to implicit "big" metaphors of planning as a profession of technical experts in the public service.

Implicit or no, "little" metaphors can add up to "big" ones. "Little" commonsense pragmatic metaphors often arise in conversation, especially seminar or informal conversation. Sometimes they are the "throwaway" lines of thinkers presenting papers, and musing upon their predicaments. Sometimes they are spoken in frustration by harried professionals.

"Think-Tank" comes to mind as such a metaphor. "Plan-stampers," "Number-Crunchers," "NIMBYs," "Dog and Pony Show," are heard in the parlance of policy and planning professionals in different regions of the country.

A metaphor is basically calling one thing another thing. It allows us to reconcile differences, to connect things which are difficult to connect. It can also be used to "cover up" for a missing form of certainty, and can reveal which kinds of certainty we are most adept at seeking. Indeed, many political campaigns or initiatives seek to substitute one form of certainty for the missing other.

It is especially useful to uncover the common sense predispositions of thinkers in their throwaway metaphors. Charles Hoch's "commonsense pragmatic metaphor" almost, but not quite a throwaway line itself, helps describe why the throwaway lines of planners and policy analysts are so important.

Our throwaway lines contain our afterthoughts about what we do. They give us key clues to the personal and institutional conflicts that we are trying to integrate. They are often witticisms which assist us on reconciling irreconcilables. Freud's (1938) famous essay, "Wit and its relation to the unconscious" might lead us to write another one--"Wit and the reconciliation of consciousnesses."

### 2.3.12 How Science Becomes Commonsense Proposition

Another key to my approach is the term, *commonsense proposition*. I maintain that these commonsense propositions, clues to our "implicit logic," as Peirce called it, predispose us to solve new problems the way we solved our old problems.

In his prescient essay "The Fixation of Belief," the American philosopher Charles S. Peirce spoke of "some habit of mind," which "determines us . . . to draw one inference rather than another" from "given premises." This Peirce called a "*guiding principle of inference*"

(Peirce, [1877] 1968, 64). Our problem-solving experience can, in part, "predispose" us to view the next problem we encounter in a similar way.

One way of extracting the "common sense" propositions from economic and other theory is to note what remains in our memory several years after we have first formally studied a topic. Those of us who are engaged in very complicated and detailed analysis can return to an earlier paper or computer solution to a problem after several years, and, even if we wrote it ourselves, find ourselves having to spend a few minutes or hours figuring out just how we solved the problem. We tend to remember the solution or tool we derived, but not always the details of the analysis.

The comedian Don Novello's character Fr. Guido Sarducci presented what he called a "Five Minute University", composed of items which are what we remember of our education years later, as opposed to what we are expected to remember at the time. Fr. Sarducci proposed half-seriously that we formalize such items, such as "Supply and Demand" from economics, and "Mui bien, gracias" from high school Spanish in our pedagogy in order to conform more realistically with what we ultimately remember and find useful.

Like any comedy, here is a grain of truth here. What we remember of our formal studies, aside from curiosities, is indeed what we have somehow found useful. Technicians cannot be assumed to be immune to this process. It is thus reasonable to assume that we incorporate the useful portions of our earlier technical learnings into our permanent store of what Peirce called, "acritical and implicit logic of the common man" (Fann, 1970, 39) as commonsense predispositions, which are only "refuted" when "surprised" (Simon, 1989, 378-9) by circumstances or new information, effectively communicated.

The "facts" of science, when divorced from the deductive and inductive scientific reasoning which produced them, often become part of the commonsense world of the citizen,

but in a generalized, often proscriptive way, e.g., "The Surgeon General (who today coincidentally is Mr. Novello's in-law) says smoking is bad for you" becomes "Smoking is bad for you"; "Alcohol consumption by pregnant women is counterindicated" becomes "You shouldn't drink when you're pregnant."

Having for a time made my living as a salesman, and thereby taking rejection as a matter of course, I personally do not think that the very useful ideas gained from formal academic study have been effectively "packaged" for use by citizens with the persistence necessary to accomplish the task.

### 2.3.13 Wrap-up

Common sense is a complex form of certainty based upon perceptual knowledge that we use to "get things done." It brings with it overtones of common knowledge, common judgment, and common virtue. Because common sense can mix perceptual, demonstrative, and moral aspects of certainty, it cannot be easily refuted by one aspect of certainty alone.

Power can control the ebb and flow of access to information, and thus to certainty. Power using violence and other similar coercion substitutes for one or more aspects of certainty. Common sense can serve as the raw material for propaganda, as both producer and product of propaganda. Common sense can thus help to either integrate or to distort.

Insight into the jumble of common sense can lead to insights into a similar jumble, the jumble of politics and public policy. By extending the "simile of common sense" into public problem solving, clues arise as to why the social sciences proved difficult either to offer solutions to public problems (Moynihan, 1969) or to evaluate them (Nathan, 1988).

Because scientific knowledge about public policies is incomplete, we live in a world of commonsense knowledge, in which abduction, loosely understood as educated guessing, plays a large part. Those few areas of scientific knowledge which are proved and in which we are familiar tend to predispose us to judging other phenomena in a similar way.

So far I have argued that in order for public action to occur, we seek to increase certainty, and prefer to have as many forms of certainty on our side as possible. It is possible to interpret the different problem-solving styles of public disciplines as arising from the kinds of certainty "environment" that each discipline faces. Within the public environment of shifting and mascarding forms of certainty, different commonsense propositions are current. In order to "refute" these commonsense propositions, it is useful to catalog them. Creating a visible catalog of commonsense propositions is what I call, *formalizing common sense*.

## Chapter 3

### FORMALIZING COMMON SENSE

This chapter will describe what I mean by formalized common sense and consider its connections with the "three certainties." Rather than first ask what is just and reasonable, I ask, *how do we make our tools work?* Once a better understanding of these intellectual tools is achieved, then questions of reasonability and justice become questions of *effective*, rather than *theoretical*, reasonability and justice. The case of power and coercion will also be considered.

#### 3.1 What is Formalized Common Sense?

By formalized common sense I mean a complex sense of certainty which we use to get things done that is organized and revealed in a visible and useful way. This has a long-standing history, with Plato's Divided Line in the *Republic* (Plato, 1956, 309), being an early example which we have retained. Contemporary examples for the formalization of common sense about human organization and knowledge can be found in James D. Thompson and Arthur Tuden ([1958] 1987), Karen S. Christensen (1985), and Walcott and Hult (1990). The scope of government mortgage subsidy programs for housing has been graphed by HUD (1974, 15-16) and remains one of the best depictions of the structure of a housing program. Lawrence White's (1991) graph of the functional relationships of government offices under the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) legislation is a model of the reduction of bureaucratic complexity to common perception.

Formalized common sense organizes accumulated wisdom of an institution, neighborhood, group, or tradition with visible tools that are readily accessible. It would include what scientists would call "classification" but rarely goes beyond classification to analysis, although analysis cannot widely be communicated without formalizing common sense.

Formalized common sense is also close enough to raw common sense to be indeterminate and inaccurate. It is a tool for action and reflection, not a rule for same. This formalized and accumulated common sense is a bridge between common sense and science. It is more than common sense, and it is less than science. It is in the process of becoming what John Neville Keynes, in his *The Scope and Method of Political Economy* (1891, 34-35, 46), and cited by Milton Friedman in his famous and seminal essay, "The methodology of positive economics" (Friedman, 1953), called an art, "a system of rules for the attainment of a given end." I propose that, faced with uncertainty, many people practice the art of planning, the application of formalized, accumulated common sense.

### 3.2 Formalizing Knowledge and Action

Commonsense propositions can be categorized in many ways, but one very useful way of categorizing these propositions is by whether or not one thinks others know correctly and do correctly, correctly being understood in a goal-oriented manner. Each one of the Know-Do combinations possible can represent bundles of commonsense propositions about expected outcomes from goal-oriented public (aggregated) action. These particular "commonsense propositions" I organize in terms of what I call the Know-Do Matrix.

One can reinterpret the use of conceptual "boxes" as evidence for formalized common sense as a distinct class of knowledge. Classification is one of the first building blocks of a science, and "boxes" assist us in formalizing or organizing our knowledge. From the "boxes" used by Talcott Parsons ([1951] 1952) to develop a general theory of action, to those used in



TABLE I  
BLANK KNOW-DO MATRIX

Aggregated and Goal-Oriented

	KNOW	DON'T KNOW
DO		
DON'T DO		

planning and management, "boxes" represent knowledge that is more than "pure" common sense, yet not quite "pure" science. They represent knowledge, as stated earlier, used in "art"--in our case the art of public problem solving.

Using these tools it will thus be possible to speak of different kinds of common sense which surround scientific analysis. Analysts must communicate what is *demonstrative* to those used to basing their decisions upon what is *moral* and/or *perceptual* as well as *demonstrative*. *Demonstrative* certainty contends with other forms of certainty in a thicket of contending reasonabilities and rationalities.

If social scientists, planners, policy analysts, and managers cannot make a case for the effectiveness of their expertise, they will be either quite simply or quite eventually out of a job. Many thus base their claims for expertise on the scientific nature of either their accumulated knowledge or of their methodology.

Underlying claims for technical expertise is the notion that there can be discerned a certain predictive, evaluative, or critical reasonability or rationality in some human systems. Just what form this reasonability or rationality takes is under dispute. When rationality fails to

persuade, appeals are made to "common sense," and expert planners or analysts legitimize their arguments based upon their track records and professional competence. There are thus many jealous claimants to the lovely hand of "common sense."

The fact that a thicket of different reasonabilities and rationalities has arisen, with such ideas as "reasonability" in common law, the difference between philosophical and market rationality, and the debate over deconstruction in literature, indicates that it is more useful for people dealing with certain kinds of problems to use one or another commonsense proposition.

It also explains why some writers seek to discover rationality, others seek to destroy it, and some, such as the impish Umberto Eco (1989), seek to do both.

The prevailing inductive reasoning and operational-definition-based discourse of academic social science, and the deductive reasoning based rational actor models of political economy are often mediated in policy practice by commonsense assumptions specific to the government agency or profession involved in a particular policy area.

Policy actors tend to follow their own common sense model unless it is persuasively contradicted by academic or policy science or by policy analysis. The distinction is deliberate. The use of the phrase policy *science* as opposed to policy *analysis* springs from Eric Hanushek's distinction between policy *research*, "the applied branch of the social sciences," and policy *analysis*, which "translates research findings into the specifics of policies" (Hanushek, 1990, 147-148).

Paraphrasing Gadamer (1990, 18) I find it convenient to place styles of argument into two general traditions, that of rhetoric, which I hold to include literary criticism and political discourse, and that of philosophy, which I assume includes scientific discourse. But because such convenient distinctions are not quite so clear in everyday affairs, it is also assumed that there are hybrid forms of discourse which combine elements of the two.

Adding to the confusion is that in the very act of convincing others of our position we are also convincing ourselves. We convince ourselves by appealing to our own common sense and we convince others by trying to change theirs.

It is very difficult to keep one's head on straight when dealing with these contending world views. So I propose using some short-cuts.

The notion of common sense entertaining conflicting possibilities is an important clue to understanding the problem that so vexed Thomas Kuhn, that of *incommensurability*, "the breakdown of communication that occurs between adherents of different paradigms" (Horgan, 1991, 49). My "working model" is that of a world filled with coexisting and contradictory commonsense propositions. These propositions are the building blocks of the "American Pluralism" we have heard so much about over the years.

Because it is useful for the refutation of commonsense propositions--and not necessarily because it is always true--I propose simultaneously viewing differing rationalities and reasonabilities through the panes of the Know-Do Matrix. A large set of commonsense propositions associated with legal reasonability, with market rationality, with scientific and other rationalities can be captured within the assumptions therein. At each stage of the learning-action continuum, each one of these types of knowledge has its own common sense wisdom which must be refuted. The panes of the Know-Do Matrix represent four general sets of commonsense propositions about aggregated knowledge and action.

But there are two more discussions necessary before we proceed, both relating to questions of certainty. Since we will discuss *perceptual* certainty as we discuss formalized common sense, *moral* and *demonstrative* certainty need to be addressed.

### 3.3 The Context of Moral Certainty

In order for there to be public problem solving, there must be some common basis for discourse. Herein I propose such a common ground.

#### 3.3.1 The Case for Hamiltonian Rationality

I propose an approach which is rooted in the task of citizens who participate in democracy, in our case drawing from, but no limited to, American democracy. Within this context the rational task of public policy is stated by Alexander Hamilton in the first paragraph of the first number of the *Federalist Papers*:

It has been frequently remarked that it seems to have been reserved to the people of this country, by their conduct and example, to decide the important question, whether societies of men are really capable or not of establishing good government from reflection and choice, or whether they are forever destined to depend for their political constitutions on accident and force. If there be any truth in the remark, the crisis at which we are arrived may with propriety be regarded as the era in which that decision is to be made; and a wrong election of the part we shall act may, in this view, deserve to be considered as the general misfortune of mankind. (Hamilton, [1787] 1961, 33)

For Hamilton, **reflection** and **choice** established good government, and **accident** and **force** were its antithesis. How striking is Hamilton's foreshadowing here of the Gettysburg Address's self-conscious recognition of an historic task for democracy. The American Revolution did not leave a permanent legacy until it articulated thus its ideas. The first lines of the *Federalist* and the first lines of the Gettysburg address celebrate the "philanthropic," as Hamilton put it, nature of the American experiment. It is not merely for our own good that we do this, but for the good of all. The world watches to see if we will succeed. People will risk their lives for the dream of giving an immortal gift of freedom to others. It is where utilitarian self-interest will not take us. It is where we have gone before. This is a powerful, evocative message, inspiration for much bravery and much folly.

In such a constitutional tradition, reflection and choice have a specific task. Rationality participating in reflection and choice rather than accident or force is rationality with a constitutional job to do. The job is to avoid accident and force while establishing good government. While the means of public reflection and choice due to their very complexity demand a significant use of technical tools as means, the ends of the use of such tools are moral ones: good government.

### 3.3.2 A Constitution and Common Sense

Robert Bork, in his legal polemic *The Tempting of America: the Political Seduction of the Law*, referred to the "common, everyday view of what the law is," which is "to apply the law as those who made the law wanted him [the judge] to." Judge Bork acknowledged that this "commonsense view is hotly, extensively, and eruditely denied by constitutional sophisticates. . . . In these matters, common sense is sound" (Bork, 1990, 5).

Bork then drew upon the late Justice and Professor Joseph Story's constitutional commentary:

Upon subjects of government it has always appeared to me, that metaphysical refinements are out of place. A constitution of government is addressed to the common sense of the people; and never was designed for trials of logical skill, or visionary speculation. (Story, [1833] 1987)

However one may argue with this interpretation, something rings true about the commonsense aspect of a constitution. I can't remember how many times as a child I heard arguing children say, "You can't stop me. I can say whatever I want. It's a free country." Even six-year-olds, barely reading for a year or more, had a commonsense (*sensus communis*) idea not of the law of but the Constitution. Is this commonsense aspect of a constitution its only rational aspect? Not in the least. But the commonsense aspect is quite evident.

Of the composition of the Declaration of Independence, Jefferson reflected that he set out to lay before the citizens:

the common sense of the subject, in terms so plain and firm as to command their assent. . . . it was intended to be an expression of the American mind. (Fields, 1991)

A constitution formally places moral propositions into permanent public perception. The process is not easily reversed.

### 3.3.3 A Constitution is a Fact Impervious to Verbal Dissolution Alone

Despite the most clever arguments of "deconstructors" of rationality, and their numerous rhetorical defeats of disputants, they cannot argue away the Constitution to which Hamilton referred. It is a public fact, indeed an artifact, which, as the Roman proverb put it, an argument cannot batter down--*Contra factum non valet illatio*. Deconstructing victors of verbal jousts in the faculty dining room awake the next morning in a nation still governed by the same old Constitution, however brilliant its verbal disassembly the night before.

More than verbal disassembly is needed to change a constitution. Indeed, a constitutional democracy which requires public choices provides a public context and tradition within which both reasonable and rational choices are made. In a constitution there spins a wheel not necessary to reinvent.

### 3.4 The Public Context of Demonstrative Certainty

It has long been the dream of reformers and of governors to take control of the disordered city and stalling cyclical markets, especially housing and agricultural markets, either so that a more efficient, just, and beautiful civilization could be created, or so that governors could continue pursuing their own purposes without disruption. While few of these cities or markets have ever been built, what have been constructed over the past few hundred years are cathedral-like thought-systems, proposing rationality in civic life and government. Far below

the echoing vaults of these systems stand practitioners who need useful and quick methods to understand and to act daily. A good deal of this ground-level methodology attempts to form an educated guess of what everyone else is doing.

Central to this guessing are working behavioral theories which can be applied to the movements, choices, and ideologies of actors in the financial process for the purposes of planning. At this point, we recall the idea about scientific points of view supporting commonsense supposition.

This commonsense supposition or presupposition is then used generally in two different ways:

1. the "projection" (figure out what's happening and "get ahead" of the process) model or
2. the "recollection" (figure out what happened and get "behind it") models of planning described by Hemmens (1981).

Because science concerns itself with predictions from theory, the "projection" model tends to draw from scientific traditions. The "recollection" model, while also drawing from science, draws from differing craft knowledge associated with professions.

It is necessary to discern some sort of order in a social process for analysis to be useful, or for planning to produce order. Public planning, policy analysis, and management, because of our lack of certainty in our understanding of society and in our ability to control social events or even correctly anticipate them, are inexact exercises in educated guessing and the art of prudent action.

With all this uncertainty, it is imperative that planners and policy shapers have an understanding of what they themselves are doing. Even this is a chancy effort. Some things are known with certainty. Others are known by probability. Still others are guessed at, while

some are stumbled upon. What is known with certainty about a future social event may not be at all important in the relative scheme of things when it happens, but it is important now because it is the only thing we know now that will happen for sure then. It is thus possible to distort the future around trivialities which are certain.

#### 3.4.1 The Tyranny of Butterflies

Like the time traveler in Ray Bradbury's story *The Veldt* who changed all of human history by traveling back to prehistory and stepping on a butterfly, we attempt to alter the future by slightly changing the spots on the butterfly we are certain to be flying within the future city of which we are uncertain.

The sometimes trivial certainties of the future can also skew the present when we pay too much attention to them. But how do we know which of the known aspects about the future are really important and which not?

Once we have extrapolated the past behavior of actors into the future with organic, historical, and probability measures, the answer is that we cannot know for sure all those social facts today which are important for the future. We might, after all, step on a butterfly today and thus knock down a building tomorrow. But we can prevent ourselves today from getting either too rash or too hesitant about tomorrow.

If that last statement has a familiar, almost Scriptural ring to it, it might be that we have again arrived at the doorstep of common sense.

The vast majority of our decisions are made without scientific certainty. We make our choices based upon our expectation of what is likely to be true, and this we generally base upon our experience and upon our choice of what we often perceive to be the most beneficial for ourselves or others. But these choices are not always our best choice nor do they always prove beneficial. Yet we constantly seek rationality.



Accepted academic points of departure for discussions of rationality in public policy begin with discussions of the methodology of the social sciences and their specific application in public policy. The noted conference at the University of Chicago in 1985 on the behavioral foundations of economic theory (Hogarth and Reder, 1986, 1987) drew together Nobel prize winners and leaders in the social sciences, and some progress was made toward a common vocabulary of procedural and substantive rationality. While drawing from this tradition to understand the commonsense propositions of public problem solvers, I do not so much attempt a systematic reinterpretation of rationality as much as I consider how differing rationalities must be "refuted" in order to solve public problems.

Another starting point begins with a clean slate in Cartesian fashion, *ex nihilo*, perhaps these days either choosing or not choosing first principles, and along the way "deconstructing" existing rationalities and then "reconstructing" them according to the new "paradigm" of particular choice.

#### 3.4.2 The Siren Song of New Paradigms

Ever since Kuhn ([1962] 1970) discussed paradigm shifts, the quest for the new paradigm has become the sought-for philosopher's stone of this age. In fields too numerous to list the ultimate academic fantasy is to be the founder of the new paradigm. More numerous than pretenders for Penelope's hand are the theories attempting to usurp the place of the absent husband Ulysses--an older, forgotten wisdom.

Practitioners of many fields now speak of their own "dominant paradigm" and seek either to overturn or to understand it, and some fields, such as planning, to find it.

Currently, economics, which more than other fields seems to have its own paradigm, is engaged in the process of questioning it. This questioning involves our discussion also.

### 3.4.3 Some Models of Rationality.

The science of economics has been very aware of the many questions posed about the nature of the rational or reasonable choices made by buyers and sellers in markets, or as they are commonly called, "economic actors." To explain the behavior of these actors, a key set of economic assumptions is used, called variably the "rational choice paradigm," the "rational man," or *homo economicus*.

A number of theories have been generated which seek social order through attempting to identify or model "rationality" in social choice and social action.

In political economy there is the "rational actor" choice model of Kenneth Arrow (1963), Anthony Downs (1957), Mancur Olson (1965), and others, with sometime critics like Amartya Sen (1977, 1982, 1987).

In social psychology, administrative science, and economics there is Herbert A. Simon's "bounded rationality" (1982) which arose in part as a response to the utilitarian microeconomic rational choice "economic man" theories of Gary Becker (1976) and others.

This rationality has been further debated in microeconomics by Harvey Leibenstein (1976), who incorporated habit and routine into concepts of rational performance maximization in firms, and argued that nonmaximization should be the standard assumption of economic theory, not maximization. Thomas Schelling, in a way paralleling Arrow's thought, stated in *Micromotives and Macrobehavior* (1978) that "aggregate" behavior is a qualitatively distinct phenomenon from the actions of "individuals." Schelling's term, "self-displacing prophecy" helps express how interacting expectations may be self-fulfilling or self-negating, a situation in which the same distribution of micromotives can lead to divergent macro-phenomena, either of greater participation or withdrawal on the part of actors in social events. This "self-displacing prophecy" has pertinence to the aggregate decisions, for example, of whites who leave their

neighborhoods, based upon the perception that their neighbors will probably move. This "prophecy" might also shed light on other aspects of the behavior of housing sector actors.

All these "rational" theories, although operationalized differently, seek to discern an order upon which social choices and actions can be based, or a discernable order which is the end product of these choices and actions. Without some degree of order, either as a condition or a product, problem-solving policy analysis degenerates into a random application of social instruments subject to the law of the instrument, "when all you have is a hammer you treat everything like a nail" (Kaplan, 1964).

In recent years, there has been a blossoming of scholarly thought about the relationship between constitutional organization and economic activity. In our time there has been something of a confrontation between the theoretical rationality we have used to explain the behavior of economic markets and earlier political, philosophical, and scientific traditions of "Reason," a favorite term of the revolutions which took place in the Americas and in Europe throughout the past two hundred years.

#### 3.4.4 Some Origins of Rational Theories.

Some of the intellectual origins of "rational" theories go back to the seventeenth century

##### Rational Myth of the State:

The tendency, therefore, was to extrapolate a rational man; to imagine how reason, and a necessity assessed by reason, would lead him to found a state; and to derive from this "mythical" rational act of choice a valid, rational reason for obeying, or reforming the state as it now is. By contrast medieval thought, like modern thought, is neither concerned with a myth of the state, nor to base the fact of political obedience upon this myth. Both regard it as impossible to extrapolate and isolate man in such a way. Political society exists concretely: whether because of God, or history does not matter; it is there. Above all, the link between the individual and the state cannot be limited to a rational obligation. As it exists, in fact, it is mysterious. We are linked to political society by something that somehow escapes our immediate consciousness: by a whole tangled skein of pressures and motives, some rational, many more not so. It is the nature of this tangled skein that perplexed medieval, as it now perplexes modern thinkers. (Brown, 1965)

This "tangled skein" of rationalities as we experience it has led to a number of problems, one of which is the conflict between economic theories and the common sense of citizens. Economists continue to propose ideas, such as the taxing of imputed rent from homeowners, which rarely are enacted. Welfare economics presents powerful logical arguments in favor of the property tax (Musgrave and Musgrave, 1984, 473), the focus of perennial citizen fulmination and political subterfuge and bamboozlement.

Eventually, some economists hope, the logic of their arguments will permeate and sway the citizenry. Later I consider how that persuasion might happen. But for now it is useful to consider a few key limitations to the *homo economicus* approach.

#### 3.4.5 Key Limits to Homo Economicus.

Hogarth and Reder provided a handy summary of the "rational choice paradigm" which provides a unifying force in economics:

This paradigm, expounded in many textbooks and treatises, supposes that the individual decision maker has a utility function whose arguments are defined as alternative uses of the resources with which he or she is endowed. The quantities of these resources are interpreted as constraints on the possible choices available to the decision maker, so the rational behavior consists of determining the set of resource quantities to be devoted to each of the possible uses as the solution to a constrained maximization problem. (Hogarth and Reder, 1986, S186)

The *homo economicus* or "rational actor" model appeals to policy scientists because, once its principles are established, a picture of a "little person" who thinks along the lines of these principles can be drawn. We can deduct the proper course of action from this "little person," or *homunculus*, almost like consulting a friendly little elf in one's pocket.

A diversity of theorists, of course, have composed their own models of this friendly little elf. In order for this approach to be effective, this friendly little elf must be able to answer a comprehensive set of questions. But the more comprehensive the answers our little elf gives,

either the more "holes" or "gaps" (Hogarth and Reder, 1986, S187) there are in such a deductive system that have to be plugged by supposition or other intellectual patches, or else the deductive system becomes an authoritarian one which contradicts common sense and reinterprets it as do some varieties of Freudian psychotherapy, wherein you get into trouble both if you agree with your therapist (transference) or if you disagree (resistance).

Because of pressing needs to solve public problems here and now, there has been of necessity something of a rush to build a comprehensive theoretical system around the "rational actor" model, and to incorporate other concepts, especially Herbert Simon's (1982) "bounded rationality" assumptions, forcing common sense into a closed system. But I'm afraid in so doing we have missed something. In our rush for certainty we have ignored our own obvious capacity to fudge things as a society. "It is because men are not angels," said James Madison, "that they submit themselves to government."

If human misconduct and unpredictability are reasons for the existence of government itself, then we should not be overly surprised if government does not comply at times within our preferred boundaries for rationality.

Our own constitutional forms of organization reveal concrete accommodations among differing forms of rationality and reasonability. They provide essential clues for enduring forces of human organization, whose scope is beyond the convenience of the little elf. The questions--how does a constitution come to be, and how does modern economics explain such a becoming--bring us to another thinker, a man not cited once in the entire volume summarizing the University of Chicago 1985 conference (Hogarth and Reder, 1986).

#### 3.4.6 Homo Economicus in Constitutional Context

One meeting place of market rationality and Reason is the work of James M. Buchanan.

Geoffrey Brennan and James M. Buchanan held that there are really two distinct usages of the *homo economicus*:

1. Constitutional choice--choice among institutions; and
2. Postconstitutional or in-period choice--the choice among alternative options within given institutions. (Brennan and Buchanan, [1981] 1984, 383)

Buchanan's approach keeps our friend *homo economicus* within the bounds of constitutional choices, arguing that the more *homo economicus* is used for individual choices, the more convoluted the arguments become, e.g., people get married to maximize someone else cleaning up the house, etc., (Brennan and Buchanan, [1981] 1984, 385, 394).

As one of the founders of the "Public Choice" school of economics, Buchanan proposed keeping the *homo economicus* model closer to our society-wide choices made about basic ways of organizing society itself, placing the economics of the self-interested "rational actor", or *homo economicus* into the constitutional context:

we should not underestimate the difficulties, indeed the moral costs, that are involved in a genuine shift in paradigm, in the very way that we look at the world about us, whether this be economists looking at politics or at any other group. It was not easy for economists before the sixties to think of public choosers as utility maximizers in other than some tautological sense. . . . If politics is viewed only as a potentially coercive relationship among persons, at all levels of conceptualization, then the economist must be either courageous or callous who would model public choosers (whether voters or agents) as net wealth maximizers. Few want to reap the scorn that Machiavelli has received through the ages. Such a world of politics is not at all a pretty place. And analysis based on such a model and advanced as "truth" becomes highly noxious. The very unpleasantness of these models of politics may explain the neglect of what now appear to be clear precursors of this element in the public-choice perspective. . . .

It is only when the *homo economicus* postulate about human behavior is combined with the politics-as-exchange paradigm that an "economic theory of politics" emerges from despair. Conceptually, such a combination makes it possible to generate analysis that is in some respects comparable to that of the classical economists. When persons are modeled as self-interested in politics, as in other aspects of their behavior, the constitutional challenge becomes one of constructing and designing framework institutions or rules that

will, to the maximum extent possible, limit the exercise of such interest in exploitative ways and direct such interest to furtherance of the general interest. It is not surprising, therefore, to discover the roots of a public-choice perspective that contains both elements in the writings of the American Founders, and most notably in Madison's contributions to *The Federalist Papers* (Buchanan, 1989, 21-23).

By placing scientific assumptions into the context of a wider constitutional rationality, Buchanan helped address some of the problems confronted by scientific economics in the world where a key assumption of economics applications, *ceteris paribus*--other things being equal--does not hold. This *ceteris paribus* assumption had lead rational expectations theorists to propose perfect foreknowledge on the part of *homo economicus* as a counterweight to complex uncertainty. Many significant schools of thought in the social sciences have made similar key simplifying assumptions in order to translate their key insights into mathematical form.

There is some risk in imbibing solely an intellectual ambrosia which is the product of these subsequently derived mathematical tools. The knowledge derived may indeed be immortal, but those who imbibe only upon it are cursed to not participate in our daily affairs but to dwell among the clouds and only dabble with us occasionally. Other mediating ideas, especially those which address the constitutional common sense of citizens, are necessary before technical knowledge is implemented in public action.

#### 3.4.7 The Constitution Supercedes Scientific Paradigms in Public Life

The formulations of the Constitutional Period sprang forth from one of those rare environments wherein ideas shaped not only government, but daily affairs. To disconnect our own questions from those of the Framers is unwise. Just as modern urban planning is less today the planning of new cities but the understanding and direction of ones that have already been built, so too is policy analysis more the understanding and direction of policies long ago given outer boundaries.

That Buchanan would refer to Madison as a precursor of the public choice perspective indicates to me that there is a wealth of current social understanding capable of being read through the bifocals of the Federalist period. The metaphor of bifocals is a rich one, for it implies a simultaneous vision of near and far, one that will play a key role in a better understanding of common sense.

The idea that the Framers considered the problems of economic planning has been given added strength by the late Frank Bourgin (1988, 1990), a hero to struggling doctoral students, whose rejected thesis was finally approved after a forty-six year effort (Cordis, 1988). Bourgin established an early foothold in the Constitutional period for questions we would today place into the public policy and planning arenas.

So it is not for us here to tinker with the alchemy of a new paradigm. I so much more greatly prefer the old task mentioned by Hamilton and synthesized by Lincoln as government "of the people, by the people, and for the people"--the establishment of good government from "reflection and choice," and the avoidance of "accident and force." The moral framework of democracy does not have to be subject to the whims of academic fashion, the endless hawking of the old wine in the new skins. It is the following through of a basic commitment to an historic task--"good government from reflection and choice." If we agree with Lincoln that such democratic government "of the people, by the people, and for the people shall not perish from the earth", searching for new political paradigms is a futile exercise. Or is Mao's more restricted "from the masses, to the masses" (Tse-Tung, 1967, 70) --without the "by" and the "for," more preferable?

Aside from a periodic questioning of all our assumptions necessary for healthy self-criticism--the "examined life" of Socrates, there is little need to search for further legitimation for the public problem-solving arts in a democratic setting. If one accepts the



historic challenge to democracy to become good government from reflection and choice, and the avoidance of accident and force, that is the ideological postulate or moral assumption for further reflection, judgment, and action in democracy. The public problem-solving arts--planning, policy analysis and public management--are thus expressions of Hamiltonian reflection and choice in democracy.

It is important to acknowledge here, however, the possibility that democracy itself is not "closed" into a Federalist straightjacket, but by its very nature is subject to change. These times provide great opportunity for the restructuring of government. From the *perestroika* of Mr. Gorbachev to the *solidarnosc* of Mr. Walesa, to the criticisms of Pope John Paul II of the incompleteness of both capitalist and Marxist forms of organization, we are presented with an opportunity to learn from the mistakes of both democratically and centrally planned economies, especially since public problem-solvers of either system can now more freely share.

#### 3.4.8 Why We Discuss These Things

The two previous sections on *moral* and *demonstrative* certainty in public affairs were necessary to establish a common frame of reference for the following discussion. I acknowledge that there are serious political and philosophical differences on these matters. But for discourse leading to action, a common vocabulary is needed, and a common framework for moral certainty. With this common vocabulary in mind, our next step is to consider the Know-Do Matrix.

#### 3.5 The Know-Do Matrix

Let us proceed, then, to construct this intellectual tool. My method will be to draw commonsense propositions from major theoretical positions, and then to discuss the refutation of these propositions.

Let us consider goal oriented behavior on the part of a group of people, and let us consider whether they know how to achieve a goal and whether they act upon their knowledge. Those that know how to achieve the goal are said to have "foresight." They foresee the future, and they act upon it.

But what of the other possibilities? What if the future is not known but the action is appropriate? What if the future is known but the appropriate action is not taken? What if the future is not known and appropriate action is not taken?

These possibilities of "know-do", "don't know-do", "know-don't do", and "don't know-don't do" can be examined from the standpoint of individual or aggregate choices. Since policy makers, shapers, and implementers more often concern themselves with aggregate behavior, it is from this aggregate point of view that the Know-Do Matrix will be discussed. I will contend that planners and policy analysts must refute as many of these four commonsense possibilities as possible (it is sometimes possible to refute only two) in their policy analysis.

TABLE II  
KNOW-DO MATRIX

Aggregated and Goal-Oriented

	KNOW	DON'T KNOW
DO	Rational Expectations	Dumb Luck
DON'T DO	Akrasia	Chaos

Like the game-show contestant who attempts to guess, not what he or she thinks the likely answer to be, but what the audience guessed the answer to be, the policy maker, shaper, or implementer without benefit of reliable survey results must guess what most people will consider to be the most likely result of a policy. It is not possible to know with certainty what the answers or actions of others will be in advance, but it is possible for the policy actor to understand that there are different ways of *not knowing* the answer. An understanding of how a policy maker *does not know* gives clues as to likely courses of action from a common sense point of view. Different kinds of unknown answers also pose a fundamental question: *What kind of problem are we having?* This is the method of *docta ignorantia*, learned ignorance (Cusa, [1464] 1981).

The Know-Do Matrix is a rudimentary first step in thinking about what everyone else is doing or going to do. Our first steps are unscientific, commonsense ones. This is not an attempt to give fuzzy thinking legitimacy, but to understand how our fuzzy initial thinking often forms our complete analysis or plan.

So let us now proceed, "box by box," and construct this tool for formalizing common sense.

### 3.5.1 Rational Expectations -- Box One.

Box One is the locus for those commonsense propositions which are based upon the assumptions that other aggregated actors both "know" and "do" the "right"--with "right" being defined in terms of effective achievement of a goal. Actors operating under these assumed attributes have perfect foreknowledge and are capable of effective action.

It is not accidental, therefore, that a body of theory has arisen along these lines. The Rational Expectations (RE) strand of economic theory, which was proposed by John Muth in 1961 and stated in more detail by Robert Lucas in 1972 and 1976, and which is now

TABLE III

## KNOW-DO MATRIX -- RATIONAL EXPECTATIONS

Aggregated and Goal-Oriented

	KNOW	DON'T KNOW
DO	Rational Expectations	
DON'T DO		

associated with a critique of a policy analysis which fails to take into account fully that the behavior of consumers and producers changes when their economic environment changes, with people's expectations neutralizing government economic policies unless these policies are truly unexpected, can be "accused" of creating the "know right" and "do right" commonsense propositions.

Rational Expectations can be interpreted as three interrelated bodies of knowledge:

1. Theoretical work describing the implications of the REH (Rational Expectations Hypothesis) to economic theory.
2. Econometric models developed to apply the REH to the testing of economic policy questions. These include models borrowed from engineering and operations analysis.
3. Commonsense propositions for public policy derived from the Rational Expectations Policy Critique of Lucas ([1976] 1981).

#### 3.5.1.1 RE Theory: The Rational Expectations Hypothesis.

Lucas's policy critique proceeded from Muth's (1961) position that "economic agents from their expectations on the basis of the 'true' structural model of the economy" (Pesaran,

1987, 21). In Muth's words, "Expectations, since they are informed predictions of future events, are essentially the same as the predictions of relevant economic theory" (Muth, 1960, 316). Begg (1982, 30) put the rational expectations hypothesis (REH) succinctly: "The hypothesis of Rational Expectations asserts that the unobservable subjective expectations of individuals are exactly the true mathematical conditional expectations implied by the model itself." Mathematically, "The hypothesis of rational expectations amounts to equating the subjective  $z$ -distribution to the objective distribution  $f$ " (Lucas and Sargent, 1981, xvi).

#### 3.5.1.2 Rational Expectations Methods

The Rational Expectations Policy Critique followed by several years the initial theoretical work in the field, which concentrated on the mathematical models necessary to test the Rational Expectations Hypothesis. These mathematical models have proliferated. Recently Charles Whiteman (1983) of the University of Iowa compiled and developed a number of new linear moving average econometric representations which approximate Rational Expectations theory, thus making Linear Rational Expectations (LRE) models more accessible to those familiar with linear stochastic models, and allowing technicians to model "rationality" to a degree mathematically. Chow's (1983) text incorporates some of these models, and Sargent's text *Macroeconomic Theory*, (1987) was completely rewritten to incorporate tested rational expectations models. M. Hashem Pesaran's (1987) book, *Limits to Rational Expectations*, describes the strengths and limitations of the RE approach and proposes alternative econometric models based upon the martingale game approach.

A discussion of the interesting interplay among the three "interrelated bodies" of knowledge associated with Rational Expectations will shed light on the formalization of common sense in this "box" of the Know-Do Matrix. It was Lucas' "Critique" of economic policy analysis which brought the words "rational expectations" to the popular press, and thus

into the language of citizens. Before we consider the "common sense of rational expectations," we must consider Lucas' important article.

### 3.5.1.3 The Rational Expectations Policy Critique: RE Meets Common Sense.

Lucas ([1976] 1981) made a number of important points in his famous "Critique" of econometric policy evaluation:

1. That actual econometric practice is at variance with economic theory.
2. There is also an "uneasy relationship between the theory of economic policy and traditional economic theory" (Lucas, [1976] 1981, 107).
3. The rationalizing power of microeconomic theory creates a situation wherein "this micro-economic role for theory abdicates the task of describing the aggregate behavior of the system entirely to the econometrician" (Lucas, [1976] 1981, 107).
4. "*Everything we know about dynamic economic theory indicates that this presumption [that the structure of the theoretical function describing an economy does not vary with discrete economic choices] is unjustified*" (Lucas, [1976] 1981, 111).

The popularity of the rational expectations policy critique of Lucas ([1976] 1981) is based in large part on the common sense nature of Lucas's hypothesis:

the econometric tradition, or more precisely, the "theory of economic policy" based on this tradition . . . is in need of major revision. More particularly. . . the features which lead to success in short-term forecasting are unrelated to quantitative policy evaluation. . . the major econometric models are (well) designed to perform the former task only, and that simulations using these models can, in principle, provide *no* useful information as to the actual consequences of alternative economic policies. These contentions will be based not on deviations between estimated and "true" structure prior to a policy change but on the deviations between the prior "true" structure and the "true" structure prevailing afterwards. (Lucas, [1976] 1981, 105)

Lucas was saying, in effect, that econometricians were not necessarily following economic theory in constructing their quantitative models for economic policy evaluation, but

were doing "what works." Lucas searched for an economic theory implicit in these working models.

The science of economics, as we have mentioned, uses simplifying assumptions, and in the case of the theoretical component of the REH, the simplifying assumption was that economic actors, in effect, had perfect foreknowledge. They were capable of consistently guessing correctly. The difficulty comes in modeling this assumption mathematically. Econometric practitioners of RE thus demand that the prediction errors of conditional expectations be uncorrelated over time. This is called the "orthogonality" property of conditional expectations (Sheffrin, 1983, 55, 8). However, as we shall soon see, it is difficult to reconcile such a model with the commonsense idea that we learn from our mistakes.

Consistent with Lucas' Policy Critique is the statement, static econometric methods do not take into account that actors will anticipate government action and adjust their behaviors to what they anticipate to be the effects of government action. When government acts, it is not just changing the magnitude of one or more variables in an econometric model, it is in a sense changing the model.

These theoretical and technical assumptions of RE, when coupled with Lucas' commonsense insight into the (dare we say, *satisficing*?) behavior of econometricians, leads to challenges to those attempting to apply Rational Expectations to questions of public policy. Here again not only do the technical, but also the commonsense problems kick in.

The RE critique has been attacked on the philosophical level (Chung, 1986) and by economists who maintain that the limiting assumptions involved in any well-conceived structural and reduced form equation system are robust enough to withstand policy changes, which, in fact, are often built into the models themselves. Econometric systems are rarely constructed to extend beyond a ten year period, anyway (Pesaran, 1990). Lucas ([1976]

1981), however, saw a lack of explanatory power on the part of models which consistently ignored readily available 1929-1945 data, and were content to model the post-war years without long-term theoretical consistency.

The economic assumptions necessary to model Rational Expectations place severe limitations upon the econometric models themselves. Pesaran notes that:

The optimization approach of Lucas and Sargent is based on the premise that the 'true' structural relations contained in the economic model and the policy rules of the government can be obtained *directly* as solutions to well-defined dynamic optimization problems faced by economic agents and by the government. The task of the econometrician is then seen to be the disentanglement of the parameters of the stochastic processes and that agents face from the parameters of their objective functions. As Hansen and Sargent (1980) put it,

Accomplishing this task [the separate identification of parameters of the exogenous process and those of the taste and technology functions] is an absolute prerequisite of reliable econometric policy evaluation. The execution of this strategy involves estimating agents' decision rules jointly with models for the stochastic processes they face, subject to the cross-equation restrictions implied by the hypothesis of rational expectations (p.8).

So far this approach has been applied only to relatively simple set-ups involving aggregate data at the level of a 'representative' firm or a 'representative' household. One important reason for this lies in the rather restrictive and inflexible econometric models which emerge from the strict adherence to the optimization framework and the REH. For analytical tractability it has often been necessary to confine the econometric analysis to quadratic objective functions and linear stochastic processes. (Pesaran, 1990, 17-18)

It is interesting to note that Lucas' Policy Critique helped to bring about a situation wherein, for a while, econometric practice tried to closely follow theory. I suspect that, with the continuing debate over the effectiveness of the structural and reduced-form equations method in econometric versus plain old regression-running, a debate ably summarized by Pesaran's (1990) essay in the *New Palgrave*, econometricians are again doing "what works",



even in applying Rational Expectations theory. Sargent's (1987) text remains the most persuasive statement on the behalf of the usefulness of rational expectations methodology.

The commonsense appeal of Lucas' Policy Critique has led to a continuing search for better RE mousetraps.

Mark Nerlove (1983) put forth the idea of "quasi-rational" expectations, partially in an attempt to avoid what he saw as theoretical pitfalls of the Rational Expectations position, and in which he relaxed some of the full information assumptions of Rational Expectations, but without fully taking Simon's position. The econometric literature has seen notable attempts to reconcile rational expectations with both policy and learning models (Bray and Savin, 1986; Whiteman, 1986; Spear, 1989; Novales, 1990).

#### 3.5.1.4 Rational Expectations Equilibrium: RE Bounded.

Two assumptions about policy behavior ran through the early discussions of rational expectations. One was that people generally guess correctly, and the other was that government sometimes can fool them. However, nobody is perfect, either in guessing or in fooling, as Lincoln pointed out in his "you can't fool all of the people, all of the time" aphorism, so another has been added, in order to achieve what has come to be called the Rational Expectations Equilibrium (REE) (Anderson and Sonnenschein, 1982, 1985), wherein

agents correctly forecast future payoff relevant variables conditional on current information. Out of equilibrium, they make systematic errors in forecasting. If agents recognize error, then learning should occur and agents will modify their behavior until the economy attains a REE. (Spear, 1989, 889)

Spear, drawing also from the 1985 University of Chicago Rationality Conference (Hogarth and Reder, 1987), is representative of those practitioners of rational expectations theory who are attempting to add learning into models of *procedural*--"in the sense that agents have algorithms" (Spear, 1989, 889)--rationality. Spear argued for rational expectations to be

framed within Simon's model of bounded rationality, with learning algorithms as the bridge. It seems that one achievement of the 1985 Rationality conference was to bring a number of RE theorists, of whom Simon complained in his 1978 Nobel address (Simon, 1982, 486), back into the bounded rationality fold. Rational expectations actors, it seems, are now gifted with "bounded" perfect foresight, and they are capable of learning.

#### 3.5.1.5 The Commonsense Propositions of Rational Expectations

As interesting as these theoretical developments may be, we are still left with the question, what is the "commonsense predisposition" of rational expectations for public policy?

There are plural answers to this question:

1. Actors guess right, mostly, and can learn to do better.
2. Policies which fool them can work, temporarily.

The first commonsense proposition is reflected in the betrothal of rational expectations and learning as just discussed.

The second commonsense proposition of rational expectations policy, that government is capable of fooling the people by introducing a surprise change in policy, is limited to those cases in which a government entity, under its statutory ability to regulate without prior public hearings, makes decisions which were not generally anticipated. These areas are generally limited to areas such as monetary policy, taxation accounting rules, and to HUD financing requirements. Policy disposition is thus bounded.

#### 3.5.2 Dumb Luck -- Box Two

The second, upper-right-hand box of the Know-Do Matrix I call the Dumb Luck or Benign Social Intuition Box, representing commonsense propositions of those who do not possess the "right" knowledge to achieve a goal but wind up achieving it anyway. Recognizing that it is often impossible to differentiate *chance* actions from unconscious or preconscious *intuitive* ones, I leave them lumped together for this presentation.

TABLE IV  
KNOW-DO MATRIX -- DUMB LUCK

Aggregated and Goal-Oriented

	KNOW	DON'T KNOW
DO		Dumb Luck
DON'T DO		

There are two principal schools of thought which I find convenient to place into the Dumb Luck / Benign Social Intuition box. One springs from a populist sentiment that the "common man" or "common woman" knows better--as reflected in their intuitive actions on their own behalf-- than anyone else what is good for him or her, even if without the precise means to explain why. Another presumes that the unintended consequences of free enterprise, driven by self-interest whether enlightened or no, are benign.

One of the fascinating ironies of public affairs is that two dominant traditions arguing for benign social intuition should be so diametrically opposed politically. The "wisdom of the masses" assumes that the free exchange of information among the masses will tend to lead to the optimal decision. The "bottom-up" advocates argue that if the "bottom's" wisdom were included in the political process, it would enlighten it in terms of social policy. Free marketeers describe their system as the true "bottom up" system. Critics respond that if each dollar is a vote, then the rich have the most votes. The "top-down" advocates argue that those owning the water can raise the tide which raises all the boats, and that information in and of itself does not provide the same kind of incentive to act as do economic forces.

It is interesting that one of the strongest advocates for the former position is named Friedmann (1987), while he arguing for the latter is named Friedman. Plato's Socrates, in the *Phaedrus* (Plato, 1937), noted that the difference between *manike*, madness, and *mantike*, prophecy, is the letter "n." Just who is the prophet and who is the madman is a matter of partisan dispute.

Those taking Friedman's viewpoint would respond that his position is neither "top-down" nor "bottom-up" but egalitarian. Friedman argues that information is not enough, that free economic exchange itself, because it alone gives people economic incentives to act (Friedman, 1979, 10), is the true moving force which creates social cooperation.

#### 3.5.2.1 The Wisdom of the Masses Proposition: "Trust the People"

In a talk given on October 6, 1988 and broadcast recently on Public Radio, former U.S. Representative Barbara Jordan stressed that local community leaders and organizations should not participate in the solution to public problems such as poverty and housing unless they, from the very beginning of the analysis, possess a role in the very framing of the question at hand. She also criticized the role of "number crunchers" as opposed to local community voices in addressing public problems. If she meant that local communities, based upon their superior grasp of local knowledge and a strong personal interest in their own predicament, should make their own decisions to the greatest extent possible, and use whatever tools of analysis are at their disposal, I fully agree with her. If, however, she implied that local communities are possessed with some innate superior wisdom which in and of itself in all cases supercedes the unbending mathematics of public resources without a continual attempt to learn every method available to understand these mathematics, then I submit that she dooms from the outset those communities she defends to a deceptive ritual to which political powers have long ago adapted:

1. The representatives of power and the local community meet,
2. the representatives of power are browbeaten or embarrassed and throw the local community a bone or two,
3. the local community goes home feeling better,
4. the representative of power goes back to work, and
5. little beyond the symbolic bone from the meeting is granted further to the community.

Without taking "number crunching" seriously, community leadership will be relegated to this kind of ritual for the foreseeable future.

The celebrated phrase of General William Tecumseh Sherman, "Vox populi, vox humbug," puts a sad perspective on the limits of uninformed citizen wisdom and of a misinforming press.

In a world in which power short of violence is measured by one's capability to act without the knowledge or consent of others, a commitment to a process of informed and shared public decision making is a long-term and difficult one. But I am convinced that the intent of Ms. Jordan's statements was to defend such informed and shared public decision making.

#### 3.5.2.2 The Invisible Hand/Chicago School Proposition: "Trust the Market"

Adam Smith's original treatment of the invisible hand bears repeating:

But the annual revenue of every society is always precisely equal to the exchangeable value of the whole annual produce of its industry, or rather is precisely the same thing with that exchangeable value. As every individual, therefore, endeavours as much as he can both to employ his capital in the support of domestic industry, and so to direct that industry that its produce may be of the greatest value; every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to

promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never know much good done by those who affected to trade for the public good. It is an affectation, indeed, not very common among merchants, and very few words need be employed in dissuading them from it. (Smith, [1776] 1952, 194)

The Chicago School of Economics has elevated the "Trust the market" ethos into a proud bulwark with key salients, manned by creative masters of their own subdisciplines. The force of free market arguments, however, remain their resonance with common sense. Although the Chicago School functions like the Federal Reserve Board of the intellect, turning up or down the intellectual thermostat of regulation, the free market is the local knowledge of the Chicago School.

#### 3.5.2.3 Formalizing the Common Sense of Milton Friedman's Position

Milton Friedman, with the assistance of television producer Eben Wilson, formalized the commonsense nature of his arguments describing the pitfalls of government spending in the following box:

Friedman argued out that Box I money, spent by ourselves on ourselves, tends to be more economized when spent, and that the "higher" one goes in the number designations of the boxes, the less incentive there is to economize on spending.

#### 3.5.2.4 The Invisible Hand and Moral Certainty

There is an exception to the assumptions of this box, and that is the classic case of the government bureaucrat so serious about one's fiduciary obligations that he or she spends no money from quadrant IV. There's another dimension at work here, a moral one.

TABLE V

## MILTON FRIEDMAN'S "WHO SPENDS WHOSE MONEY" MATRIX

YOU ARE THE SPENDER

WHOSE MONEY	ON WHOM SPENT	
	You	Someone Else
Yours	I	II
Someone Else's	III	IV

(Friedman, 1980, 107)

Table from *Free to Choose: A Personal Statement*, copyright 1980 by Milton Friedman and Rose D. Friedman, reproduced by permission of Harcourt Brace Jovanovich, Inc.

3.5.3 Akrasia -- Box Three

TABLE VI

## KNOW-DO MATRIX -- AKRASIA

Aggregated and Goal-Oriented

	KNOW	DON'T KNOW
DO		
DON'T DO	Akrasia	

The third box of the Know-Do Matrix represents those situations wherein the correct path to the goal is known but it is not followed. We "know the good" but do not do it. (In order to avoid a paradox here, in this case I refer to "not do" as "do the wrong thing," not as "do nothing.") Economic science has found it useful to prove, in the Socratic tradition, that such intentional behavior against one's considered judgment and self interest is impossible. But consider that, if such action is not possible, why are there theories of management which assume people behave in such a way, such as what Douglas McGregor (1960) called, Theory X? Notwithstanding the fact that Mc Gregor himself preferred his own more optimistic Theory Y, organizations are managed with more draconian Theory X principles under given circumstances, such as when thievery is rife.

#### 3.5.3.1 Akrasia Defined

According to some, it was Socrates' contention that bad moral conduct is in all cases ignorance, intellectual error, and that there is really no such state as what Aristotle later called *akrasia*, "knowing the good and yet doing the evil" (A.E. Taylor, 1954, 141).

It seems to be at the root of the rational planning model to follow a kind of Socratic framework but without the Socratic intent: "If only we had the right information, the plan would work (or the conflict would cease, or productivity would increase, etc.)"

Philosophers have debated the concept of *akrasia* for centuries, and it was held by many until the recent work of Amelie Rorty (1972, 1980) (Rorty listed four places for akratic break to occur: (1) Assent to major premise of practical syllogism. (2) Assent to pertinent minor premise (3) Assent to a conclusion. (4) Action.), and Mele's (1987) *Irrationality* that fully conscious action against one's own will was not possible.

Yet, where in this irrational world, with its madness and violence and dumb mistakes, does all this irrationality come from, if *akrasia* is impossible?



The aforementioned works of Arrow, Downs, and those in the political economy tradition have provided some of the answers. These thinkers have demonstrated how the "rational" choices of individuals when interacting socially can lead to situations wherein socially irrational options are chosen by groups. These thinkers proved that what looked like akrasia to a citizen was really, for our purposes we can call refuted akrasia, *pseudo-akrasia*.

Game theorists have attempted to model societies based upon these assumptions, but their work has not progressed far enough to provide working models of housing markets suitable for effective policy analysis. In the mean time, something else is needed.

### 3.5.3.2 The Augustinian Answer to the Rational Man

Earlier we alluded to Peter Brown's treatment of the myth of the "Rational Man." Against this Myth Brown placed those who follow in the Augustinian tradition and face, according to Brown, Aurelius Augustinus' central problem: "To what extent is it possible to treat man (sic) as having a measure of rational control over his political environment?" (Brown, 1965, 313). "On this point," stated Brown, "Augustine is quite explicit:"

'For no one is known to another so intimately as he is known to himself (sic), and yet no one so well known even to himself that he can be sure as to his own conduct on the morrow. . . . (Augustine-Dods, 1875, 145)' This is the specifically Augustinian contribution to the problem of free will and determinism: for him, man is so indeterminate, so discontinuous, so blind in his intentions and haphazard in his attempts to communicate, that he must be determined by some forces outside the horizon of his immediate consciousness-- For Augustine, of course, by God. . . . Now if man cannot determine himself entirely in consciousness, in moral intention, in communication, how much less can he claim complete self-determination in politics: how can he presume to claim to impose an intention planned by his reason on that scrambling box of human wills, presided over by God. (Brown, 1965, 313-315)

While Augustine's position was value-laden and theological, it recognized that people were subject to the whims of others, many of whom did not act in their own best interest even if they knew what their best interest was. While such an attitude was acceptable for the ancients, our modern tastes seek a much more orderly world.

Historians such as Heer (1968) and most recently Leonard Krieger (1989, 11-23) have traced the variants of this Augustinian vision throughout political and social thought. Herbert Simon's suggestion that rationality is "bounded" is at least an echo of this more ancient tradition.

Key insights in economic theory since 1945, especially those in the tradition of Arrow and Downs which help to explain how individual desired choices can sum to undesired aggregate choices, have helped to give an aspect of rationality to seemingly irrational public choices. The challenge for thinkers from a "Public Choice" perspective has been to make a firmer connection between individual choices and public choices. This the sociologist James Coleman (1990) has attempted.

I have found it interesting that often economics relies not upon itself but upon historical research to build a foundation for economic argument and subsequent prediction. Where history ends, it seems, economic science begins. If history is good enough for the foundation of economic argument, then its wisdom should also be good enough to put the assumptions of economic theory in perspective. I maintain that rational models, while useful, do not take into consideration irrational behavior--which many economists argue is impossible, or at least statistically insignificant-- and intentional wrongdoing.

I suppose it is somewhat unfair to ask this question, but which of the many public policy writers in America predicted the Savings and Loan debacle in advance?

Martin Mayer (1990) cited an article he wrote shortly after the Garn-St. Germaine Depository Institutions Act predicting a disaster, but even he, at the time a member of the President's Commission on Housing, admits he had no idea of the great potential scope of the disaster. Professor Lawrence White's (1991) fine book on the S and L "Debacle" took a policy "high road"--few names of policy makers were included in his book, and his discussion

centered around how twists and turns of policies, not as Mayer would have it, bad technical and moral choices, led to the debacle. The Congressional Budget Office (1991) recently put forth the notion that it was the use of the cash accounting method, which only recognizes liabilities as they are paid for, which did not give budgetary "early warning" to those responsible for lending policy.

What is interesting to me is that in such discussions there are two approaches: one (White, CBO) speaks of policies as if they were encased inside a vacuum bottle from which akratic human behavior has been drained, and the other (Mayer) breathes the akratic air outside and interprets policies in light of it. It is a fact of life that a policy analyst with the command of policies of a Professor White who publicly named names like Martin Mayer would not last long in the analyst business. But in the long run that is precisely the kind of knowledge that is necessary to avoid horrendous policy errors, and ultimately to build a science of policy out of its component problem solving arts. To build such knowledge, we must acknowledge a formal place for akrasia, the irrational decision, and for decisions which "look" irrational.

#### 3.5.3.3 An Akratic Commonsense Proposition--"Good" Can Lead to "Bad"

A commonsense proposition from the Augustinian tradition is that "good" acts can have "bad" consequences. Milton Friedman (1979) refers many times to the deleterious results of "well meaning" public policies. For quite some time, rational models have operated within the constraints of a Socratic assumption of invincible knowledge, which we are about to discuss. The Augustinian tradition also recognizes a residue of irrationality and wrongdoing in culture, and to the degrees these behaviors have been institutionalized and accommodated, or worse, ignored, we do not understand what others have done or will do. The Augustinian suggestion that "good" acts could have "bad" consequences suggests to us that knowledge is not

"invincible," as position that some of Jurgen Habermas' followers, speaking of his concept of Universal Knowledge, seem to follow.

#### 3.5.3.4 Wagner on "Political Entrepreneurship"

Richard E. Wagner describes how *political entrepreneurship* increases *entrepreneurial error*, and the resultant economic inefficiencies:

Most importantly, the very ability of those who control government to accomplish their ends depends largely upon their ability to create entrepreneurial error. Policy is concerned primarily with creating rents for favored clientele, paid for by taking --directly through taxation or indirectly through counterfeiting--from those not so favored. Political entrepreneurship, within our present institutional order, consists of finding ways to promote such transfers and to capture a brokerage commission or finder's fee in the process. To use the same method of theft repetitively would not be effective political entrepreneurship, for the victims would come to develop better ways of protecting themselves. Of course, the more complex the economic reality, the less rapidly will victims come to make the correct inference and take evasive action; so the amount of rent that could be captured from repetitive policy would be larger than in a less complex economy. (Wagner, [1980] 1984, 263)

Wagner ([1980] 1984, 260) also describes the role anticipation of cycles has upon policy. The old rejoinder of Chicago mayor Richard J. Daley, good politics is good government is good business, assumes that there are instances when the commissions charged by politicians lead to public and business choices which are socially beneficial, especially in cases wherein, if such commissions (e.g., campaign contributions or hiring of specified individuals, subcontractors, or attorneys) did not exist, little business would go forward. Mayor Harold Washington attempted to "tame" the process, by obstructing projects until socially beneficial commissions (e.g., minority hiring goals) were agreed upon. While such "political commissions" are part and parcel of urban pragmatism, they take on dangerous proportions when elevated to a national scale, wherein billions in government funds are exchanged by legislators for infinitesimal fractions of their value in campaign contributions.

Citizens have long ago developed a commonsense proposition as a response to political entrepreneurs chanting the "good politics is good government is good business" hymn. The citizens' proposition is, "And how much is this going to cost me?" or in its shorter form, "Hold onto your wallet."

#### 3.5.3.5 Planning as the "Sanitizer" of Dirty Politics

In a culture where political "commissions" are assessed of those seeking public contracts or favors, professional planners can be morally compromised. Ambitious planners can discern the wishes or intentions of their political sponsors and can tilt public decisions in the direction of those favored contractors within the circle of their sponsors. Plausible professional reasons can be given for tilting decisions, and the ambitious planner can later be rewarded with promotions or responsibility.

One of the more common strategies for planners amidst highly contentious public questions is to "declare a tie" among those seeking to obtain a public contract or to recommend a policy option. The political administrators are then free to make a choice based upon political influence, but the process has been "sanitized" by the moral authority of the planning profession and its scrutiny. The choice of the State of Texas as the site of the Superconducting Supercollider seems to have followed such a process, with a tremendous amount of professional studies, hearings, and consultations being produced prior to the declaring of a "tie" among several states and the final, if not inevitable, bipartisan choice of Texas.

Is it too cynical a question to ask, would not much public expense and effort have been spared if such a decision were made solely on a political basis in the first place?

Planning, at its worst, can function as a legitimizing--and quite expensive--shield for what in the end proves to be political influence.

### 3.5.3.6 Mr. Justice Holmes on the Law as a Bad Man

Martin Mayer, in his muckraking treatment of the Savings and Loan Scandal, quoted Justice Oliver Wendell Holmes, Jr.:

If you want to know the law and nothing else, you must look at it as a bad man, who cares only for the material consequences which such knowledge enables him to predict, not as a good one, who finds reasons for his conduct, whether inside the law or outside of it, in the vaguer sanctions of conscience. (Holmes, 1897; Mayer, 1990, 122)

### 3.5.3.7 Pragmatism and Common Sense.

One of the more interesting paradoxes of American thought is how impractical pragmatism, meaning pragmatic philosophy, sometimes can be. The Augustinian tradition--with its somewhat world-weary sense of the moral limitations of public actors--does not have much of a dialogue going with pragmatic philosophy. It seems I have tried to draw what is useful for public problem solving out of both traditions.

I differ with the pragmatists because the irrationalities and willful wrongdoing in government are difficult to explain without recourse to commonsense akratic propositions. Problems not only can be wicked, as we have discussed, but so can policy actors, as the Savings and Loan Scandal has reminded us.

In this discussion of akrasia I have revealed my Chicago roots in the slant I have placed upon rent seeking in the political process. Our generation of planners and policy analysts have been trained to screen akrasia out as impossible, and what I have written here goes against the grain. But I ask my reader to reserve judgment on akrasia for now, and the usefulness of assuming akrasia is there even when it really isn't will become clear further on when we attempt to "refute" akratic common sense. The citizen, despite the best efforts of social scientists, still thinks akrasia *is* there. Retaining a notion of commonsense akrasia as a part of a formal inquiry method allows us to better intuit what citizens think, how they will react, and

what they will do. Retaining commonsense akrasia provides a quick and useful proxy for inquiring into a host of phenomena we do not always have the tools, the budget, or the time to evaluate.

#### 3.5.4 Chaos -- Box Four

TABLE VII  
KNOW-DO MATRIX -- CHAOS

Aggregated and Goal-Oriented

	KNOW	DON'T KNOW
DO		
DON'T DO		Chaos

The the fourth, lower-right-hand quadrant of the Know-Do Matrix puts forth propositions that actors in the aggregate do not know the right thing to do and do not do it. There are basically two kinds of chaos at work here:

1. mathematical chaos, which might eventually be analyzed; and
2. commonsense chaos, which might not.

##### 3.5.4.1 Mathematical Chaos

Mathematical chaos does not mean what we imply by our everyday usage of the term "chaos," that is, disorganization or lack of order. Indeed, mathematical chaos seems to have elements both of randomness and of orderliness, the latter of which appear as graphic

patterns, the former of which appear as seemingly random fluctuations within these graphic patterns and/or beginning and ending at seemingly indeterminate points of fluctuation.

The importance of chaos for economic modeling has been underlined by Casti, who calls for

skepticism about *any* modeling effort that relies upon parameter estimation unless it can be demonstrated beforehand that the true parameter values do not lie in the chaotic region. If this is not the case, then there is little hope that observations on the past behavior of the system will provide a basis for identifying the parameter values, and a model based upon such a spurious identification will almost certainly be quite useless. Casti (1989, 244)

How is mathematical chaos described? Conceptually, it is described as a nonrandom, nonlinear, and unpredictable process that is extremely sensitive to initial conditions, or the starting point, of a mathematical model. Infinitesimal differences in initial conditions of chaotic models result in exponential, wild variations in resulting calculations.

William Baumol and Jess Benhabib described three characteristics of mathematically chaotic systems:

1. a trajectory (time path) can sometimes display sharp qualitative changes in behavior like those we associate with large *random* disturbances (for example, very sudden changes from small-amplitude to large-amplitude cycles, and vice versa), so at least some of the standard tests of randomness cannot distinguish such chaotic patterns of change from "truly random" behavior;
2. a time path is sometimes extremely sensitive to microscopic changes in the values of the parameters--a change in, say, the fifth decimal place of one parameter can completely transform the qualitative character of the path;
3. they may never return to *any* point they had previously traversed, but display in a bounded region an oscillatory pattern which is consequently very "disorderly." (Baumol and Benhabib, 1989, 79)

William Barnett and Seungmook Choi state that a "rigorous and formal definition for chaos" in the mathematical literature is met if a time sequence has these three properties:



1. *Sensitive dependence* on the initial conditions (called the *seed*),
2. a form of stationarity,
3. and nonperiodicity. (Barnett and Choi, 1989, 145)

Geometrically, mathematically chaotic systems seem to function within certain spatial boundaries, and observations in chaotic datasets seem to follow an orbit or trajectory near or around other key points, called "attractors", upon the "phase space" graph representing the process. In the terminology of mathematical chaos, a one-dimensional graph plotting a variable "against itself" at different time periods is called a graph in "phase space"--as opposed to our commonplace two-dimensional "state space" graph with Cartesian coordinates. A "phase-space" graph allows us to analyze minute patterns in datasets.

These "attractors" just mentioned are not stationary points but dynamic processes, and are often assumed to possess the properties of fractals. When graphed in "phase space," chaotic patterns seem to "orbit" around points which are themselves in motion.

Mathematical chaos is also referred to as deterministic chaos, since it is possible to model patterns of fluctuations which seem to be very sensitive to starting points:

In all chaotic systems--from the weather to the population of African locusts each year--a slight disturbance can make a world of difference. "A very small perturbation, in due time, can make things happen quite differently from the way they would have happened if the small disturbance hadn't been there," explains Edward N. Lorenz, a meteorologist at Massachusetts Institute of Technology and one of the early workers in the field of chaos--a name coined in the early 1970's after Lorenz posed an intriguing question in a lecture: Could the flap of a butterfly's wings over Brazil spawn a tornado over Texas? . . . . If the butterfly flaps its wings in a region of the atmosphere that is very unstable, then this disturbance will grow rapidly. But if it flaps in a stable region, then nothing will happen. . . . This means meteorologists must take great care when adjusting the starting data. If they "place" the differences in the wrong geographic location--i.e., in a stable region--the Monte Carlo technique will fail because the forecasts will agree even when they aren't accurate. (Monastersky, 1990, 280-281)

Foster Morrison's (1991) text offers suggestions for fitting models to these patterns.

### 3.5.4.2 Baumol and Benhabib on Mathematical Chaos in Economics

In their survey article on economic applications of chaos theory, William Baumol and Jess Benhabib (1989) offered a few suggestions for the examination of chaos in economic systems, the precise mathematical nature of deterministic chaos still remaining not known:

It is, however, not known yet whether "observable chaos" is implied by sensitive dependence on initial conditions. It is also possible to show in some cases that the frequency distribution will be the same for almost all initial points in  $S$  (see Woodford, 1989). (Baumol and Benhabib, 1989, 97)

Under these conditions,

since the value say of  $Y_{t+1}$  is completely determined by  $Y_t$  in a deterministic system, using this frequency distribution is of no use for forecasting. (The conditional distribution of  $Y_{t+1}$  given  $Y_t$  is degenerate.) It is also not possible to forecast  $Y$  some periods ahead by a linear stochastic difference equation that somehow makes use of this frequency distribution. Therefore, for modeling purposes, the temptation actually to treat the dynamics of the nonlinear system as if it were generated by a simple stochastic system should be resisted. (Baumol and Benhabib, 1989, 97)

Also, we do not know if the set of numbers which can give rise to "observable chaos" in a difference equations like the one cited by Baumol and Benhabib,  $Y_{t-1} = wY_t(1-Y_t)$ , is small.

"Matters are different, " according to Baumol and Benhabib, "if one turns to difference equations whose graph is piecewise linear and has the shape of an inverted V."

If the slope of this graph is everywhere greater than unity in absolute value (except at the apex, where slope is, of course, not defined), then it is easily shown that the equation will give rise to aperiodic time paths from almost all initial points and all of its periodic time paths will be unstable. Moreover, the chaos in this case must be observable in the sense just defined. If we perturb (change the parameter values of) such a difference equation slightly, but the slope continues to be greater than unity everywhere that the equation is defined, except the apex, these properties will clearly continue to hold. An economic equilibrium model which demonstrably gives rise to observable chaos that is also robust under perturbation is provided by Woodford (1989). (Baumol and Benhabib, 1989, 97)

### 3.5.4.3 Bounded Randomness or Deterministic Chaos?

I like to refer to this dual random/deterministic aspect of mathematical chaos as "bounded randomness," with something of a nod toward Herbert Simon's (1982) "bounded rationality," which echoed Mannheim's substantially rational social action. But just where do we set the boundaries of bounded rationality?

If areas of "bounded randomness" can be found within a mathematical model, it might help provide us with a more precise map of the "boundaries" of "rationality" within a given model. Previously, it was possible to speak of bounded rationality without stating where the boundaries lay.

Because, ironically, there seems to be order and boundaries to what previously seemed random variation, mathematically chaotic systems are considered deterministic, non-random systems.

Just as there can logically be an infinite number of fractions within a bounded area of infinity, so there might be randomness within order. Others may disagree, and call chaos totally non-random and deterministic. The fact that chaotic systems are unpredictable yet deterministic draws a fine line with randomness. So I prefer to think of it as randomness with boundaries.

If chaotic actions seem random within certain limits, once a pattern is discovered in chaotic data its randomness, while unpredictable, might still be contained within expected boundaries. Unfortunately, these boundaries are often only seen graphically in hindsight, and boost what might be a visually-based commonsense self-deception that the entire model is understood. It might also encourage us to err in the other direction, and convince ourselves that there is no order here.

A chaotic time path, according to Baumol and Benhabib (1989, 97) "can resemble one that might be expected of a deterministic model, but which is at the same time subject to very large random disturbances occurring at randomly determined intervals."

Gerald Strom (1990) has contributed to the "Spatial theory" treatment of legislative theory, addressing the topic of chaos therein as he outlined the symbolic modeling of legislative action in two dimensions.

I envision that an appropriate test of mathematical chaos in housing markets would be the long-term modeling of changes in discrete events in the histories of thousands of city lots in a given geographical area based upon county recorder data. Perhaps such datasets would be large enough to produce the kind of variation necessary for an appearance of mathematical chaos in local housing markets. But until such a large-scale study is done, it is questionable whether one can proclaim flatly that there is mathematical chaos in housing markets. Chapter 8 looks further into the matter.

#### 3.5.4.4 The Allure of Chaos for Planners

T. J. Cartwright's (1991) recent article in the *Journal of the American Planning Association* explored the implications of mathematical chaos for planning. Cartwright's position revealed less about the empirical existence of mathematical chaos in social systems than it did about the appeal of commonsense propositions of chaos for planners.

Without first demonstrating its pervasiveness in social events, Cartwright drew this "suggestion" from chaos theory:

Many planners--among them David Braybrooke and Charles Lindblom (1963), Andreas Faludi (1973), and Yehezkel Dror (1983)--have argued that we need to learn to plan with incomplete information and have proposed strategies and techniques for doing so. But they have done so for largely pragmatic reasons: because there is not always time to do so, or because we lack the necessary means or skill. No doubt these problems arise. But what chaos theory suggests is that planning based on prediction is not merely impractical in some cases; it is logically impossible. Essentially, this is because of the finite nature of perception, observation, and calculation in an infinite world. Thus, what we perceive as order can nonetheless beget disorder--a pretty staggering idea. (Cartwright, 1991, 45)

From his exploration of mathematical chaos in a simulated population model, Cartwright drew "implications of chaos," which I prefer rather to call "commonsense propositions."

Among these were:

1. "The notion that the world is at once easier and yet more difficult to understand than we thought."
2. "Gathering more information or constructing more elaborate models about chaotic systems can become pointless."
3. "We must get used to working, not with one or two forecasts of the future, but rather with an 'ensemble of forecasts.'"
4. "We must learn to rethink some of our deep-rooted beliefs in the virtues of order and predictability and the 'untidiness' of chaos and disorder."
5. "Chaotic systems are predictable on only an incremental or local basis."
6. "For chaotic systems, the shortest distance between two points is not always (so to speak) a straight line." Cartwright suggests that we perhaps should "overshoot" or "undershoot" our planning goals, or that we should try "a succession of judicious 'nudges' rather than . . . a step by step recipe" (Cartwright, 1991, 53-54).

Where there is chaos--or, rather, the expectation of chaos--there is incrementalism.

There's one catch here: in the long run, for these commonsense propositions to hold, mathematical chaos has to actually be there. Proving this, as we shall later see, is indeed difficult. Note, however, how the notion of "ensemble of forecasts" echoes the notion of contending common sense propositions. It is also essential not to confuse mathematical chaos with commonsense chaos.

If you allow for chaos, you take a social Pascal's wager in reverse. Pascal's wager, you might remember, is that, it is safer to assume that there is a God and that we will be eternally

accountable for our behavior than it is to assume that there is no God and anything goes. If the stakes are eternal, it is better to be on the safe side. In the case of chaos, it is tempting to assume that there is no God harmoniously directing the crystal spheres, or playing dice, for that matter. We assume disorder, and act accordingly. Sometimes, however, it is necessary to prove chaos is not there in order to convince everyone to quit playing it safe and to cooperate--such as the effort to end the "liquidity trap" during the Great Depression of the 1930's.

#### 3.5.4.5 Bounded Randomness and Common Sense

The questions posed by Cartwright and others concerning planning and mathematical chaos, and the commonsense propositions put forward by Cartwright do indeed demand serious scrutiny especially in our discussion of housing policy. It can be argued that the housing markets and interest rates resemble a chaotic mathematical system, possessing what I call "bounded randomness." Because of the possibility of deterministic chaos in such a system, housing market models must be used in conjunction with other methods for making policy judgments. This we will do after we have reviewed the context of housing policy.

#### 3.5.4.6 Commonsense Propositions and Chaos

There are several commonsense propositions associated with chaos. For mathematical chaos, the commonsense proposition is, things are out of control but we might figure them out. For commonsense chaos, things are out of control, period. Were TV's Kojak a policy analyst, he might say, "It's Schlumperei City, baby."

Drawing from Cartwright's work we can also derive two more propositions: "Nothing Works" and "Rules can be Broken."

Government responses to commonsense chaos are long-term, institutional ones. In a following chapter, we will observe what Herbert Hoover did as Commerce Secretary: he pooled

the best knowledge, created professional standards, and this from a "government that governs least" person. The free marketeers can only speak of the true faith because the air has been sufficiently purified by previous regulation and standardization. It is from within the culture of standards (a response to chaos) that a radical free market is even thinkable. It is because we have held chaos in check that we could stand to let a little of it out of the box to shake things up a bit.

### 3.5.5 Summary of Some Commonsense Propositions

TABLE VIII

#### SOME COMMONSENSE PROPOSITIONS

Grouped by the Assumptions of the Know-Do Matrix

	KNOW	DON'T KNOW
DO	People Guess Right Government Surprises	Trust the Market Trust the People
DON'T DO	Good Leads to Bad Bad Leads to Good Hold Onto Your Wallet	Nothing Works Rules Can Be Broken Muddle Through

### 3.5.6 Bridge to Action: Technique and Story

Each school of thought has a technical component which may or may not have something to do with their commonsense arguments. Each school of thought also spins their own tale with the commonsense propositions contained in more than one of our "boxes." What

results are different "stories" made up of commonsense propositions acknowledged or emphasized differently by contending factions.

Each "story" seeks to connect the dots between one commonsense proposition and another in a different order, using differing intermediary ideas. Opponents of housing cash subsidies, for example, argue that recipients will misspend the money on frivolous items, or drugs. They do not "trust the people" to make wise individual decisions, yet they "trust the people" to properly advise the government what kind of services serve them best. The free marketeer "trusts the people" to make wise individual decisions, yet does not "trust the people" to make wise collective ones regarding their demands for public programs. Policies built around these "stories," composed of "commonsense propositions," sometimes confound our discourse on the facts of housing policy. It is useful, therefore, to explore the commonsense propositions buried in United States housing policy, and to unravel the "stories" composed by these building blocks.

Oftentimes, the ideas connecting one commonsense proposition of a story with another are key areas needing empirical scrutiny, long obscured by ideology. Long-run policy research, therefore, can change the course of the policy story by questioning the appropriateness of the mediating ideas. Short-term policy analysis can change the story by questioning the commonsense propositions themselves.

### 3.6 Conflicting Stories Built with the Same Commonsense Propositions

I propose reinterpreting propaganda as "stories composed of commonsense propositions," and conflicting propaganda as "conflicting stories composed of the same commonsense propositions."

By way of example, let's review the "trust the people" debate mentioned earlier in our discussion of the Know-Do Matrix. The free marketeer proposes to "trust the people" to make



the right economic decisions for themselves in the long run if given housing vouchers. "Political progressives" oppose such a move, "trusting the people" to demand appropriate housing programs. The free marketeer, however, does not "trust the people" to set their own interest rates by vote, but only by market activity and by the Federal Reserve. The reasons given by the "Progressives" or the free marketeers for "trusting the people" in some contexts but not in others rest upon arguments that people will make choices which are less than optimal, if not "perverse" in their effects.

Thus the "trust the people" narrative picks up the theme of *akrasia*--"people will make the wrong choice against their better judgment." If this situation is let go long enough, there will be *chaos*. However, if my position were followed (say the "Progressives" or the free marketeers), then we will have a stable situation in which we can husband our resources for the future, which we will be able to predict with reasonable certainty (*rational expectations*). The political propaganda of contenting factions can thus be composed of the same commonsense propositions of the Know-Do Matrix, differing in focus and emphasis, "telling a story" about a political position being disputed. Contenting political factions use some of the same commonsense arguments about different things, and make differing circuits around the Know-Do Matrix.

These contending commonsense stories appear throughout public commentary. Recall Moynihan's famous passage:

From the wild Irish slums of the 19th century Eastern seaboard, to the riot-torn suburbs of Los Angeles, there is one unmistakable lesson in American history: A community that allows a large number of young men to grow up in broken families, dominated by women, never acquiring any stable relationship to male authority, never acquiring any *rational expectations* about the future--that community asks for and gets *chaos* (emphasis added). (Will, 1991)

It is no wonder that the social sciences have failed, time and again over the years since the Great Society of the 1960's, to provide persuasive answers, even when they be the right answers, for matters of social policy (Moynihan, 1969; Nathan, 1988).

Once we begin to construct "stories" out of commonsense propositions, we go beyond common sense to something that is more than simple common sense, but less than science.

### 3.6.1 Wrap-Up

This chapter really described two kinds of formalized common sense:

1. the simple transmission of visualized certainty, such as a map or a chart, and
2. the collection of commonsense propositions into a commonsense framework, the Know-Do Matrix.

The second step of formalizing common sense actually began to make with the "raw material" of common sense something other than a complex sense of certainty.

Just as Aquinas took the part of the method of the Muslim Aristotelians and made them his own, so we can take from the method of deconstructionism, separate it from its Cartesian and Rousseauian idealism, which I find distracting for the choices of citizens and too cumbersome, that is, not parsimonious enough, for discussing economic activity, and carry on an inquiry through dialogue in a constitutional context. I especially do not want to engage in the technical language of deconstructionism because it is foreign to the language of American public affairs, which more and more is the language of public economics clashing with the language of common sense.

Deconstructionism is one of several useful methods for conducting academic inquiry, but public policy analysis must keep in mind that it is public problem solving, and as such must use the language of the citizens. Philosophical principles inform the inquiry, but are not the dominant language of it.

It is true that you can deconstruct anything. It is also true that a goodly number of people will not listen to your advice after your do so.

By collecting commonsense propositions from more than one source into categories, we begin to build a bridge between the untutored statements of common sense and those of scientific inquiry. After we build this bridge, we can use both ends of the bridge, the commonsense and the scientific, to complement and inform one another.

But first we must build the bridge. Let us now look at the next step in my proposed method of inquiry, the accumulation of common sense.

## Chapter 4

### ACCUMULATED COMMON SENSE

Lonergan and Olson both mentioned the cumulative nature of common sense. When an individual practices the discipline of *historia*, within his or her profession, he or she seeks to develop a storehouse of "usable" history that pertains to the question at hand and informs it.

This chapter considers questions pertaining to the use of accumulated common sense, and attempts to build a bridge between common sense and science in policy judgment.

When analysts make policy judgments, they base these on a complex sense of certainty. This complex sense of certainty has many "layers," especially when the public question at hand is a complicated one. The "layers" of certainty can be interpreted in light of the overlappings of the "Three Certainties" introduced earlier: *perceptual*, *moral*, and *demonstrative*.

In science, one uses the minimum of material at hand, and no more than necessary, in drawing inferences and testing them. Public affairs use whatever is at hand to support policy positions. Once a fact or fable has established itself in the accumulated storehouse of public consciousness, scientific demonstration alone will not erase this fact or fable in and of itself. Science and common sense must accommodate one another as this fact or fable is reshaped.

When I write of the art of public problem solving, I write of formalized common sense, and use the vocabulary for it developed herein. But I realize that, without some connection to scientific inquiry, this formalized common sense will remain the doomed tool of partisan propaganda, just as many policy analysts remain the "hired guns" of political partisans.

For that reason I write of formalized common sense standing with one leg in propaganda, and the other in science. Formalized common sense can step in one direction and become propaganda, and can step in the other and become science. Common sense propositions, as the raw material of both propaganda and social science, are not to be treated lightly. It does indeed pay to know "what side of common sense you're on." Thus it makes sense for us to ponder the "leg" of common sense that stands on the "science side" before we step forward into the housing policy jumble.

Considering the accumulated wisdom of a discipline helps serve as an anchor against the storms trying to wash us out to sea. Positivist science, for all its power, sometimes treats each question as if it had no history, no institutional structure shaping its motions. It is thus appropriate to look to the discipline of planning as it has come to be practiced in the United States for clues to the nature of formalized and accumulated common sense.

#### 4.1 Planning as the Applied Art of Formalized and Accumulated Common Sense

The world is more complicated than either literary or scientific traditions would have it be. The strengths of these traditions are drawn upon by practical men and women, sometimes simultaneously, in order to solve public problems.

I choose to emphasize formalized, accumulated common sense as distinct from the formal academic debate on rationality in public policy and the literary criticism challenge to rationality by uncovering (or constructing, i.e., inventing) multiple rationalities--reasonabilities really. Scientific rationality dominates discussions of quantitative analysis, while literary reasonability--the rhetorical tradition--has much to say about qualitative analysis. Both classes of analysis inform the judgment of the citizen, and ultimately the shape of government action or lack of action. It is foolish not to try to understand both as interacting in a public process, which they do. This attempted understanding is the "wider rationality" or "wider vision" which

I seek, and for which I use tools of formalized common sense. These tools are used by the discipline of planning as it has developed in the United States.

I recognize in formalized, accumulated common sense the notion of planning itself, and choose a self-reflective "middle voice" between the Scylla of the First Person reasonability of current literary critics and the Charybdis of Third Person scientific rationality. So doing, I seek to approach a wider rationality or vision which encompasses the myriad reasonabilities and rationalities practiced by citizens participating in democratic governments which are both creators and creatures of public policies. This is similar to the conception--but the not the execution--of planning as described by the late New Deal "Brains Trust" Rexford G. Tugwell: planning not from the "outside in or from the bottom up," but from the "center out" (Hemmens, 1991).

The planner dwells in the world of local knowledge--where it floods, how to site or maintain the parks, where not to build and with what materials, where to put the garbage, who can get the job done, which neighbors will make life impossible for a development, which agency to apply for what first, "what works here." It was, in its ancient form, the practice of the priest, the measurer and predictor of floods, and of the military engineer, the siter of the camp. With democracy it became more than the prince's polymath genius, a tradition known since Syracuse's Plato, the Medici's Leonardo, and capped by Weimar's Goethe--poet, lawyer, and mining engineer. Italy's Vilfredo Pareto, economist and civil engineer, introduced its decisions to the precision of the economic technician, ending for a time the period of the coincidence of renaissance artist and public problem solver.

Planning is, in its institutional form, democratic republic or no, the creature of government regulation and especially of local regulation. In free republics it dwells, in its most ceremonial form, in the tradition of the town hearing or meeting, of local democracy, of the

citizen, for better or worse. In centrally-planned economies, separated from local common sense, it is typified by the joke, common in Eastern Europe and current now in the West, that:

One of the great achievements of communism is to have proven the Bible wrong. According to the Bible, in the beginning there was chaos, and then there was order.

The Russians know that first there was planning, and then there was chaos.  
(Bane and Dundes, 1991)

Planning may implement exclusionary regulations like the Lake Forest, Illinois, requirements that lots be of a certain large size and that public hearings be held before a homeowner can install an energy-efficient furnace, or the Deerfield, Illinois, requirement that closet lights have more expensive wall switches as opposed to pull-strings. The follies of planning are common, but the accumulated wisdom of planning is an institutionalization of the wisdom of common sense.

It is possible to view, in the thousands of local ordinances democratically enacted by village, town, city, and county councils the "expert" local common sense of citizens. Planning and zoning ordinances, especially, dealing as they do with practical problems of environment, health, building, transportation, sanitation, security, *ad infinitum*, represent the *accumulated* common sense of citizens. The art of planning, that is, the discipline of planning, *formalizes* this accumulated common sense into an object of comparative study and application. Democratic planning can thus be viewed as the **applied art of formalized, accumulated common sense.**

Planning is the research arm of local democracy, planners the pawns in the regulation and administration of local government. Not simply by default, but because of the "common sense" required to perform the maddening task, planning mediates among government agencies with a level of detail that, in part because of prohibitive costs of doing so, is rarely done by attorneys outside of court proceedings.

Public planning, because of the intimate connection between local commonsense knowledge and "getting things done," walks a fine line between local participatory democracy and the manipulations of local mandarins. It is, as sociologist Gerald Suttles (1990, 272) has described it, "constrained collective behavior."

Planning, indeed, in a way complementary yet distinct from policy analysis, engages in the art of public problem solving. It uses some of the same information gleaned from **normative** and **positive** economics, as Friedman understood the elder Keynes to mean them, but organizes this information in different ways. An art because science is incomplete, of necessity planning must attempt to be comprehensive because action cannot wait for scientific certainty on all aspects of a given problem. Like the biblical Ishmael who parted ways with his father Abraham and his half brother, Isaac, the heir to the Covenant, planners share the heritage of scientific political economy but not its birthright.

Planning, like other technical arts, manages a treasury of collective common sense accumulated over centuries. Societies' responses to each catastrophe, each minor disaster of physical or social proportions can be carried forward as institutional memories formalized by countless unwritten customs, and written laws and regulations from local to international scope.

But there is a trick here. We must as public problem solvers practice the discipline of "remembering" the accumulated wisdom it is sometimes politic to forget.

#### 4.1.1 Institutional Forgetting.

The loss of institutional memory is a key danger in the public policy arena. The complexity of public information often allows key insights and bitter lessons to be obscured by the tumbling mass of fact and obfuscation that flutters daily past citizens out of government windows into the dumpster archives of recyclers or into the file boxes of specialists. Decades later, after laboring mightily, we discover dusty plans for a long-forgotten wheel that we have



just reinvented. In the housing policy area, wherein every scheme seems to have been tried before by someone at least twice, commonsense solutions are literally forgotten. In housing policy, the wise recognize that they have forgotten twice as much as they now know. It is time to formalize and visualize institutional memory so that useful public lessons will not remain oversimplified or forgotten, but remind us to make common sense solutions possible. This process is part of what Orlebeke (UIC-SUPP Seminar, November 7, 1983) called, "discovering policy."

Proprietary ownership of ideas can prevent the implementation of insights. Knowledge as hoarded or territorialized in academia and government makes it difficult to build upon good ideas promoted by one's predecessor. Instead of working machines composed of useful ideas, bureaucracy tends to build intellectual Nieman Marcus bomb shelters, wherein creative ideas are used to insulate and entertain the inmates.

Try a few more metaphors. In academia, rubric is important. Incense must be offered to every saint buried in the cathedral before one prays for one's petition. A scholar must clear a spot in the nave, cluttered by others' votive candles, for one's own humble vigil lamp. In bureaucracy, by contrast, a change of administration can bring an almost Thermadorian redefinition of what had gone before as the scourge of Civilization and Reason. Roll out the guillotine, to the barricades! So it goes with the change of political regimes and their effects upon public bureaucracy.

Intellectual construction is another matter. Academics patiently wire together an art museum's worth of ideas, and, once these thought systems are reinforced and properly scaffolded, they are propelled slowly across the quadrangle by the expiring breaths of tenured laborers and underpaid exploiters to storage. Academia, like the Chicago trades unions, seems to have gotten an ordinance enacted which requires old useless structures to be removed piece by piece instead of blown to smithereens.

Bureaucracy, on the other hand, tends to be quite liberal with the munitions, which, however, mysteriously succeed in producing little more than loud booms and periodic redistributions of dust.

#### 4.1.2 Planning and Policy Analysis Can Provide Continuity and Context

Perhaps there is another way, and this way involves placing the entire toolkit of policy into the public domain as the property of all and the proprietary hoard of none. My argument is that if you sing your song long enough, and if your song is catchy enough, people forget who wrote it and who sang it first. But they whistle it every time they hear it in the elevator.

To this task the disciplines of public sector planning and policy analysis must rise, and assert a form of moral authority which preserves as part of the discipline itself the storehouse of accumulated wisdom and institutional memory necessary to accomplish the tasks demanded of them. Just as planning departments do not throw out their baseline physical maps with each change of regime, neither should analysts within bureaus toss out knowledge, contacts, and information accumulated over many years by predecessors. Neither should analysts consider each public problem as a *tabula rasa* without previous institutional structure or constraints. To do so would be "against common sense."

This "formalized and accumulated common sense" approach differs from that of positive science in that positive science is capable of creating elegant proxies for accumulated knowledge, following Milton Friedman's metaphor of the pool shark who behaved as if he knew the laws of physics. The pool shark thus becomes a proxy for the laws of physics. The pre-holiday sales of wrapping paper become the predictor of retail volume.

The metaphors of positive science can stand alone. They do not necessarily need the accumulated local context in order to explain and predict. But public policy cannot do without the accumulated local context, the "what works here." This accumulated local context helps us

to anticipate, to explain, to persuade, and to act. These actions require complex senses of certainty. These actions require common sense.

#### 4.2 What "Common Sense Should Have Told Us"

Often, when there is a policy disaster of one kind or another, one hears the refrain, "Common Sense should have told us that idea wouldn't work." But just how does common sense tell us that a public proposal won't work?

One way of deriving an answer to this question is to look at the accumulated wisdom of public problem solvers. M. Granger Morgan and Max Henrion in their fine book on uncertainty in quantitative risk and policy analysis, listed their "Ten commandments for good policy analysis":

1. Do your homework with literature, experts, and users.
2. Let the problem drive the analysis.
3. Make the analysis as simple as possible, but no simpler.
4. Identify all significant assumptions.
5. Be explicit about decision criteria and policy strategies.
6. Be explicit about uncertainties.
7. Perform systematic sensitivity and uncertainty analysis.
8. Iteratively refine the problem statement and the analysis.
9. Document clearly and completely.
10. Expose the work to peer review. (Morgan and Henrion, 1990, 37)

Note how Morgan and Henrion's method captures scientific inquiry and situates it within the context of formalized and accumulated common sense. I like to describe their method as "two laps through the retention pond." First, you fill your swimming pond with the universe of

knowledge about your problem. You then swim through your pond once, picking up only useful ideas that pertain to your problem. Then, you drain the pond of those items which do not pertain to your problem. As you swim through the now smaller pond, you drop buoys at those points labeled "assumptions," "decision criteria," "policy strategies," and "uncertainties." You then leave the pond, and draw a map for others to guide them through it. You then refine your map, making sure your buoys are accurately placed and named, perhaps rearranging them, and make sure that your map is readily understandable. You show your map to your smart friends who give you new ideas about how to make a better map. Then you make a better map, and give it to those who asked you for it.

Where is the underlying common sense proposition in Morgan and Henrion's "ten commandments"? My first impulse is to say, "Never go swimming alone," but that is only part of it. The statement, "before solving a public problem, make a list of everything you know and don't know about a problem, review how you know and don't know it, and draw a problem solving path through your knowledge and lack of it," is closer to their method. It is presumed that it makes sense to know what you know and know what you don't know, and that one should not act before one performs such a review. Our minds do this for us instantly, once we are in familiar surroundings. The trick in public problem solving is, how do we make the surroundings familiar?

Again we recall the aspect of common sense associated with prudent judgment, which I can state as "know the extent and limits of your knowledge and the extent and limits of your capacity to act upon that knowledge or lack of it. Then act accordingly." Davey Crockett probably meant something similar when he said, "Make sure you're right, then go ahead,"

The Brazilian educator Paolo Freire (1970, 1973) in his controversial method of *conscientization*, which has been bastardized as "consciousness raising," described what he

called the "unaudited variable," that factor of a problem which has been lying around us, almost just "below" our consciousness, and yet we have not focused our attention on it. The "unaudited variable" of the technician is often the local knowledge of local residents, who are amazed at the "lack of common sense" of the technician. The technician visits and sees a world that looks physically much like his or her own, and assumes that its local rules are also the same. But they may not be, and only after a month might the technician find out, "Oh, we never do it that way around here," because of some local reason.

"Common sense should have told us that wouldn't work" operates in the housing policy arena when one ignores, ala "unaudited variables," the lessons of centuries of human tradition, especially those traditions which are reflected in the common law pertaining to property. These have force similar to the "factual" aspect of a constitution mentioned earlier. The housing policy applications of this idea we shall discuss in the next chapter.

#### 4.2.1 Searching to Find Out Which Side of Common Sense We Are On.

Sometimes, "what common sense should have told us" is dead wrong. That is why "knowing which side of common sense you're on" is so essential. The Know-Do Matrix, by allowing us to collect and categorize commonsense propositions, allows us to critically assess the commonsense propositions associated with alternatives which we are about to choose. By identifying which commonsense propositions correspond to the forces limiting our predicament, we can identify "which side of common sense" we are on. Are we moving toward, against, or away from a given commonsense proposition? We will take up this method after exploring more "layers" of the problem.

#### 4.2.2 Unintended Consequences

While it can be argued that some degree of knowledge precedes action in the case of individuals, in many cases a society has no idea what it is doing when it does it. Those who

wrote the Declaration of the Rights of Man or who attended the Communist Second International had no idea they would be unleashing a Napoleon or a Stalin within a decade and one half. Those mid-level officials who promoted a benign policy of establishing defense plants in rural areas during World War II unwittingly helped begin the decline of the "Rust Belt" cities by simple administrative action (Galbraith, 1981, 110). Those officials who insisted upon building public housing high rises against the advice of local wise men like New York's Lewis Mumford or Chicago's Ed Marciniak, although warned, did not seriously consider the possibility that generations of the poor would be marred by the subsequent concentrated neglect. The Congress which approved the first interest deduction in the first federal income tax act had no idea that deduction would become the cornerstone of government policy supporting home ownership and one of the largest transfers of wealth within our society.

These unanticipated consequences have had as decisive an effect upon the structure of our society as have the most carefully planned designs of legions of researchers, officials, and elected representatives. It is the inadvertent act which often determines lifetimes of countervailing effort in the face of unchangeable circumstances.

One encounters, when reading Milton Friedman, the commonsense proposition that the unintended consequences of free enterprise have benign effects, while the unintended consequences of interference with free enterprise have perverse effects. But there is another way of looking at unintended consequences and how societies have coped with them.

#### 4.2.3 Law as Accumulated Common Sense and Response to the Unintended

The most powerful argument on the behalf of the "constitutional" approach to economic policy is that the common law has had centuries of experience of coping with unanticipated consequences, and that new laws or policies purporting to create new opportunities out of old rights tend to create unanticipated consequences to the degree that they vary from the "old"

categories of constitutional and common law traditions. This argument will be taken up in the housing policy chapter. For now it is sufficient to stress that a model of public judgment which takes into account both "projection" and "recollection" issues is badly needed.

#### 4.2.4 Taking Stock

So far this chapter has considered the question of accumulated common sense and judgment by searching for a common context for commonsense and scientific inquiry. That context is public judgment on public questions. To these questions everything from vague local knowledge to scientific precision are pertinent. That a profession such as planning should have arisen indicates that formalized and accumulated common sense performs an important social function. That another profession, policy analysis, has arisen argues that the formalized and accumulated common sense of planning is not enough. We next reconsider the formalized and accumulated common sense of planning insofar as it participates in and applies law and regulation, and consider how policy analysis links to these questions.

#### 4.3 How Planners Use Common Sense

Planners treasure common sense. They accumulate it, collect it into report and archive bins and graphs which they draw from their storehouse to allow differing groups to achieve a common vision. The practice of Lake Forest City Planner Charles Crook, who draws rapidly upon his overhead projection device to depict simultaneously as he speaks, is archetypical planning practice. In Chicago Plan Commission meetings of yore, wherein many of the decisions seemed to be made in advance, there were perfunctory attempts to elevate before the Commission visual offerings of the question at hand, but more often these depictions were ceremonials lifted before the craning necks of the gallery and the commissioners as much to say, yes, there was indeed an idea here, never mind what it is, we give it our blessing. In either case, whether the public actually gets to understand and approve or not, some effort has been made at a common vision.

To this common sense of planning come other disciplines as they pertain to democratic discussions of the use of land and resources beginning locally and extending throughout the entire democracy--architecture, law, engineering, history, rhetoric, policy analysis, economics, behavioral sciences, public health, geography, meteorology, computer science, agriculture, manufacturing, commerce, art, and philosophy. The arts and sciences brought forward in the public forum are grist for planning's mill. Each and every of these disciplines provides information that can continually be **platted** or **mapped**, or placed upon a **calendar**, the underlying tools of the planner, whether planning is practiced within our heads, within a traditional local government setting or as strategic planning within business. **To plan is to draw a map with pictures or numbers or words and to make a calendar about the map, learning to use what is old on the map to work on what is new.**

Often, planning cannot wait for incomplete sciences to provide the best answer. Consulting science, looking to art for clues, planning relies on citizens to decide, and attempts to provide these citizens with the most accurate, pertinent information available in a form that can be understood and communicated, and as prescribed by public policy.

If public economics is the child of science, then planning is the child of common sense. The bias of planning is thus the bias of common sense, the bias of local knowledge. Planning can substitute its local and professional values for that accumulated common sense of the citizens with whom they are supposed to be planning. Government and institutional planners can also ignore important market signs to which business people, who daily get information from the ebbs and flows of sales, are immediately privy. Positive economics often can provide quick proxies for this daily economic information. This is where planning, with its many commonsense propositions of coinciding *perceptual* and *moral* certainty, has had to come to terms with the *demonstrative* certainty of public policy analysis.



#### 4.4 Local Regulation a Bridge Between Markets and Common Sense

It is generally agreed that prices contain information about markets and also provide incentives to act. How does the knowledge accumulated through the operation of free markets accumulate? One way is cumulative information about prices, but another is regulation (Posner, 1976), especially local regulation. Were prices the only locus for information about markets, those choosing to start up or locate a business would look only to prices to inform their decision. They would be most unwise to do so, and in fact, do not do so (McDonald, 1984, 88).

Information contained within local and regional regulation is key for any human endeavor seeking to operate within a given area. The accumulated knowledge about a place or government contained within local regulation is valuable indeed. For purposeful corporate action within such a context, a mastery of formalized and accumulated common sense is essential. But it is often not enough.

#### 4.5 Planning Seeks in Policy Analysis the Demonstrative Certainty It Lacks

When he quoted the phrase, "pessimism of the intellect, optimism of the spirit," planning historian Marc Weiss (UIC-SUPP PPA seminar, March 7, 1984) noted that the stereotypical policy analyst will tell you why you can't do something while the planner will tell you why it's important to try.

Because planning is applied common sense, and common sense includes specialized personal knowledge, and specialized personal knowledge is limited, it sometimes causes as many problems as it solves.

Because planning is applied common sense, it can be more immediately applicable to provide temporary "solutions" to public problems in local cases than is policy analysis.

Because policy analysis is formalized public problem solving with a strong economics association, it tends to be more accurate regarding economics than is planning, which may or may not consider economic questions.

Because planning is applied, formalized, accumulated common sense, and if a planning process collects the formalized, accumulated common sense from many locations, it can be more generally comprehensive than policy analysis.

Divorced from accumulated local knowledge, planning becomes the rigid apparatus of central government planning only, violating the principle, noted in Catholic tradition, of *subsidiarity* (Furfey, 1978; Gremillion, 1976), that the central authority should not reserve to itself those decisions best made locally.

It must be noted here that local planning represents direct intervention in free local markets, forbidding, for example, the building of structures on a flood plain or of heavily polluting industries directly above a water table. Local markets are regulated locally by the principle, "what works here." Sometimes, it is the local market itself which reveals "what works here" the first time a costly flood drives homeowners from their permanently damaged homes. Knowledge of civil engineering thus can predict other similar occurrences elsewhere, and those "elsewheres" can be regulated. The history of city sanitation and water management is replete with examples of the failure of unplanned sewage facilities built by entrepreneurs in booming 19th century American towns, requiring Chicago, after six successive years of cholera and dysentery epidemics, to plan a municipal sewage works in 1855 (Peterson, [1979] 1983, 20). Had such rudimentary regulation and subsequent engineering not taken place, the "Chicago School" of free market economics would today be standing amidst the puddles of the frontier Chicago wetland (Goodspeed, [1916] 1972), with the threat of cholera, at that.

Local knowledge can only go so far, however. Without the measures of demonstrative certainty such as Pareto efficiency and the welfare economics calculus as drawn upon by a wide body of policy analysis practitioners, planning is often limited in its appeal to demonstrative certainty to areas of demographics and engineering.

What came to be called policy analysis grew since the time of Herbert Hoover out of several traditions, among them economics, engineering, operations management and analysis, political science, law, and other social sciences. Policy analysis, the child of "politics and the professors," Henry Aaron's (1978) celebrated phrase, took the stage as public problem-solving, today drawing much from Herbert Simon's (1989) definition of the scientist as problem solver.

Today, policy analysis, that new wine relentlessly being blended with academia's old (every political scientist, engineer, lawyer, planner, educator, or economist can qualify as a policy analyst under the proper set of circumstances), seems to be--no surprise to Weberites--stalling as a movement just as it has grown as an institution. Tied as it often is to the methodology of economics, it shares the limitations of economics as noted by Herbert Simon. Speaking informally in a *New York Times* interview, Simon reflected:

"Economics is a science, and like all sciences it is drastically incomplete. . . . But economics has become a little too fascinated with abstract models, and its empirical side has been a little too much preoccupied with how it can deal with bad aggregate data by using sophisticated econometric methods, and it has kind of ignored the possibility both of doing experimental work or actually getting inside firms and seeing how people do make decisions, what information they do have and how they use it. . . .

"Most of the empirical studies of this kind that have been made find that people aren't optimizing largely because there is no way of computing what the optimum is, but there is a way of computing when you should stop thinking of possibilities and start doing something. . . . The stuff I've done in artificial intelligence was motivated originally by trying to find models for economic decision-making that actually were feasible to compute. And in artificial intelligence, unless it does compute, the program doesn't run. It's good discipline" (Simon, 1988).

#### 4.5.1 The Young Herbert Simon and a Planning Problem

It is interesting that Simon's brief and informal reflections on his recent scientific practice would resemble his recollections of his "first piece of scientific work," a paper for an "independent projects" course in the winter and spring of 1935 for Professor Jerry Kerwin at the University of Chicago. The topic: a bread and butter city planning problem, the proper division of funds between playground equipment and playground activity leadership salaries in the city of Milwaukee (Simon, 1989, 377; 1935).

Simon's recollected thought process is important enough to quote in detail:

My previous study of economics provided a ready hypothesis: Divide the funds so that the next dollar spent for physical maintenance will produce the same return as the next dollar spent for leaders' salaries. I saw no evidence that anyone was viewing the decision in this way. Was I surprised? Perhaps, initially, but on reflection, I didn't see how it could be done. How were the values of better activity leadership to be weighed against the values of more attractive and better-maintained neighborhood playgrounds?

Now I had a new research problem: How do human beings reason when the conditions for rationality postulated by the model of neoclassical economics are not met--for example, when no one can define the appropriate utility function, or suggest how the contribution of expenditures to utility is to be measured? After further investigation of the particular situation before me, I thought I could see a rather simple pattern of the mental processes. Those who were organizationally responsible for playground supervision wanted more money spent for leadership; those who were responsible for the physical condition of the playgrounds wanted more spent for maintenance. Generalizing, people in organizations bring decision problems within reasonable bounds by identifying with the partial (and more nearly operational) goals that are the particular responsibility of their own organizational units (Simon, 1947, chap. 10). Simon, (1989, 377-8)

Simon went on to say that this problem led him over the years to the concept of *organizational identification*, to a doctoral dissertation by John P. Crecine (1969) over thirty years later which built a computer simulation of municipal budgeting, to what economists call *bounded rationality*, to what psychologists call *computational constraints on human thinking*, and his coining of the term *satisficing*:

A large part of the answer explains that, when people don't know how to optimize, they may very well be able to satisfice--to find good-enough solutions. And good-enough solutions can often be found by heuristic search (Simon, 1955; 1982).

Now what does this anecdote say about finding problems as an essential component in the process of scientific discovery? One thing it says is that a problem I found in 1935 has lasted me for 52 years. I have never had to find another. More accurately this very broad problem of accounting for human rationality has served as a powerful generator for an endless series of subproblems. . . .

Another lesson to be drawn from the anecdote is that scientific discovery is incremental. . . . Steps taken 20 years later led from bounded rationality to satisficing, and from satisficing to heuristic search.

Third, the anecdote adds another to the long list of examples where surprise was a key element in discovery. But what was "prepared" about his particular mind? My training in economics, and the evocation of that training in the context of a budget situation, disclosed a contradiction between what theory taught me ought to be happening and what my eyes and ears showed me to be actually happening. Without the training in economics the observed behavior would have appeared "natural." Without the observations, I could have continued in the happy illusion that the neoclassical theory of utility maximization explains human behavior in the domain of budgeting. And because my exposure to the economics profession was still rather minimal, I had not acquired the habit, so common in that profession, of ignoring the real world when it contradicts the theory.

Nothing mystical, Nothing Magical. Can we simulate it? The heuristics indeed resemble quite closely those of KEKADA, the program that Deepak Kulkarni and I have used to simulate the research strategy of Hans Krebs, who found the chemical path for the *in vivo* synthesis of urea, a program that has now been generalized to other discoveries (Kulkarni and Simon, 1988). The program experiences surprise when its expectations are not met, and reacts to its surprise by seeking explanations for the surprising phenomena. . . . Simon (1989, 378-9)

The preceding excerpts from Simon's essay, "The Scientist as Problem Solver," illustrate Simon's lifelong interest in the bundle of problems connected to that one municipal budgeting problem, now claimed by economists, public sector accountants, planners, policy analysts, and public administrators as their professional turf. One definition of public policy analysis as public sector problem solving stems from Simon's tradition.

There are two strands of argument that lay within Simon's discourse important for this thesis:

1. the strand of common sense as implicit decision rule (note that Simon did not share with us his specific answer for the Milwaukee park problem, but gave us a list of the theoretical discoveries the presumably still arguable budget priorities led him to), and
2. the strand of what Simon called "reaction to surprise," which will lead us to my proposed proper place for "abduction" (as defined by Charles S. Peirce and promoted by Hilda Blanco) as a bridge between common sense and scientific problem solving.

#### 4.5.2 Wrap-Up

In this chapter I have attempted to show that accumulated common sense has been an important and useful factor in public affairs. Through planning and related disciplines formalized and accumulated common sense informs public judgments. Regulation "captures" formalized and accumulated common sense about a place or a nation. Planning seeks to make purposeful action possible within the constraints of both markets and regulation. We next seek to put this applied common sense to good use.

This chapter has attempted to set the stage for a more comprehensive form of policy inquiry by arguing for a legitimate place for institutionalized planning in a democracy, and that an understanding of the common sense information formalized and accumulated by such institutions, be they local, regional, or national, is necessary for effective public action.

We also took a look at the relationship between planning and policy analysis in terms of these discipline's methods and consideration of certainties.

This chapter also made the case for formalized and accumulated common sense as a necessary background for scientific inquiry, as we use both science and common sense to address questions of public policy. Key public policy disciplines of law, planning, and policy

analysis each respond in some way to the need for this formalized, accumulated common sense. Common sense provides a context for the application of scientific methods to public policy in two key ways:

1. by providing the background universe of commonsense propositions from which scientific inferences are drawn, and
2. by providing a basis for judgments about these inferences.

This chapter considered the first of these as they pertain to questions of public policy. Now for the question of common sense and public policy judgment itself.

## Chapter 5

### **A METHOD FOR POLICY JUDGMENT--CONVINCING OURSELVES**

The challenge for every analyst is to quickly make sense of the bundle of facts obscured by the "fog of policy," and to effectively communicate one's analysis in a "usable" form. The method I propose, that of formalized common sense, systematically makes various guesses about what is going on in a given public problem, based on the assumptions represented by the boxes of the Know-Do Matrix. It then analyzes which forms of certainty must be utilized in the refutation of previous common sense about such policy in order to proceed to collective action. This method of inquiry traverses the boxes of the Know-Do Matrix not in an invariant way, but in a search-sequence suited to the problem at hand. The "box" itself allows one to "audit" the problem-solving analysis at given points for "unaudited variables."

The history background developed is necessary because without it we might go ahead willy-nilly and simply correct our econometric models of housing markets by mathematical methods alone, making, for example, adjustments for autocorrelated error terms and then being done with it. But without asking a wider question along with our statistical manipulations, we might have no information we could use to make judgments which would be "wise" in the sense that we'd expect policy shocks again.

For an expert who has mastered any one of these areas--the historian, the econometrician, the housing business owner, the housing analyst--most questions are answered in hindsight using the vocabularies of their particular disciplines. But using this method of formalized common sense, each of these different kinds of knowing begin to



complement each other. It is possible to develop a "mediating sense"--Aristotle's original meaning for common sense--about housing policy. We get a better idea about what works and what doesn't and why.

### 5.1 Common Sense within Qualitative Scientific Induction

Once we get a better idea, we tend to choose from among alternatives. Let us consider the framework of such an inquiry.

Charles S. Peirce spoke of three kinds of scientific induction:

1. *crude* induction,
2. *qualitative* induction, and
3. *quantitative* induction. (Rescher, 1978, 2)

Peirce considered abduction part of *crude* induction, the initial forming of hypotheses. The "process of elimination" among contending hypotheses of the Know-Do Matrix which I described earlier, Peirce would describe as *retroduction*, according to Nicholas Rescher, who also summarized Peirce's *qualitative* induction as "the collaborative meshing of abduction and retroduction, of hypothesis conjecture and hypothesis testing " (Rescher, 1978, 3).

This schema of crude, qualitative, and quantitative induction nicely complements my forthcoming suggestion about "directions" of moving toward common sense, moving away from common sense, and moving against common sense. What I call "formalized common sense" fits into Peirce's stage of "qualitative induction," where both abduction and retroduction occur as qualitative scientific judgments are made.

Although in solving public problems we are engaging in an art, since we are for the period of his intellectual exercise disciples of Peirce, we are also engaging in inquiry which might eventually build a policy science through the refinement of knowledge based upon the testing and retesting of refining hypotheses.

Although I am not optimistic about a policy science, neither do I wish to rule it out. Too much is overlooked if we define ourselves as pruned from the growing "organon" of scientific inquiry.

If a policy science is ever to exist, this science must establish its independence from political propaganda, which confounds the social sciences in government applications at every turn. The gateway between the knowledge of science and the action of politics can be represented as the four permutations of the Know-Do Matrix. Refutation of political common sense can provide a foundation upon which a science of policies might be built.

I write the word "might" because of the difficulty of the task. In the mean time, problem-solving which keeps in mind the task of refuting common sense might not only gain effectiveness but might contribute pieces to the policy science puzzle.

The positivist notion of solving problems by making simplifying assumptions has led us into a situation wherein we have lost control of the whole. One way of envisioning the whole is to use the technique of the dialogue, wherein the strongest notions of either side confront each other, and then there is judgment. This is the method of Shakespeare, of Tolstoy, and of Shaw. In a way, the positivist trap has led to predictable results. The Know-Do Matrix can be used as a tool to guide us as we travel between quantitative and qualitative induction. The "directions" can bridge crude and qualitative induction. They are the "directions" of dialogue.

#### 5.1.1 Catching Another Quick Breath

The comments preceding a previous chapter introduced the image of a bridge between common sense and science, from either end of which we can transport information which informs inquiry and ultimately judgment. Common sense forms some of the raw material for both crude and qualitative induction in the Peirce scheme of things.

When forced to make a decision in a context of uncertainty, our first task is to convince ourselves of the appropriateness of our decision, and doing so we wrap scientific knowing within the complex certainty of common sense. The succinct comments used by a man freed by a new drug from years of schizophrenic symptoms to describe the change in his condition--"My common sense returned" (WGN News Broadcast, 2/10/92)--indicate the integrating function of what we call common sense to bind together complex thoughts, knowings, and judgments leading to action. In the public arena, having convinced ourselves of our course of action, our next task is to convince others, and this involves common sense, and more.

The notion of "directions" for common sense provides a practical shorthand for informing our "convincing ourselves" decisions in situations of inquiry, for argument, or for action. The trick of using any shorthand, however, is that we be aware of the context within which we use it. In the case of adding "directions" to the Know-Do Matrix, the key contexts are inquiry, argument, and action. The "directions" serve us differently in each context.

#### 5.2 A Method of Inquiry Leading to "Convincing Ourselves" Judgment

One quick method of inquiry using formalized common sense is to move "toward, away, and against" common sense.

By moving "toward" common sense I mean examining the problem as it first appears or as it is first perceived. As much of the problem as is visible can be mapped quickly out. Then, by moving away from *perceptual* certainty toward *demonstrative* and *moral* certainty, the limited nature of the first commonsense views of the problem are revealed. Unlike science, however, which tries to avoid considering questions of moral certainty, this method directly considers questions of moral certainty, for these components of the problem link it to its political context. Also, by considering the moral dimension of the question, those "what works

here" wisdoms are preserved. After considering the "away" questions, we formalize our new common sense with word or graphic and return to the new perception of the problem by "moving against" the old common sense notions we originally had.

This method can be combined with commonsense propositions collected within the Know-Do Matrix. One such strategy of inquiry could be, consider each "box" for as many of the "directions" are necessary to inform one's decision whether to keep or eliminate the particular "box" as a possibility.

The use of "directions" in inquiry is not necessarily an invariant sequence, although there is a certain logical progression inherent in:

- moving *toward* common sense by exploring qualitatively the commonsense propositions associated with the present state of a given public question;
- moving *away from* common sense by testing aspects of these propositions and stories composed of propositions quantitatively; and
- moving *against* common sense by confronting the "old" common sense with the new "refuted" common sense of the preceding qualitative and quantitative examination.

This resembles our familiar "scientific method," but with a specific recognition that to persuade our audience of the truth of our findings, we must be aware of "what side of common sense we're on."

To go back to the previous example of the contending stories about housing vouchers, you would move *toward* common sense by outlining the different arguments concerning the anticipated effects of housing vouchers, you would move *away from* common sense by testing in quantitative and qualitative ways whether these arguments are correct, and, with the evidence you produced from these tests *translated into something visible*, like a graph, you confront the *perceptual certainty-based* "old" common sense with the use of the "new" *perceptual certainty-based* common sense.

This method is a variation on the old "observe, judge, act" inquiry method, but I must now distinguish it from a currently popular method of qualitative induction.

#### 5.2.1 The Post-Positivist, Constructivist Model Contrasted

In a synthesis of useful insights on qualitative evaluation, Egon G. Guba and Yvonna S. Lincoln (1989) proposed a new "post-positivist, constructivist" model. But it can be argued that their "fourth generation evaluation" model merely clothes the old neo-Scholastic "observe, judge, act" *methode d'enquete* popularized by the Belgian Abbe Joseph Cardijn through the worldwide *Jeunesse Ouvriere Chretienne* movements beginning in 1918 (Rouzet, 1935; Zotti, 1991). The Abbe Cardijn popularized the "observe, judge, act" method he had found in Aquinas' consideration of the elements of prudent judgment.

The collaboration of Guba and Lincoln has resulted in the interesting synthesis of the Jocist ideas which permeated the University of Chicago during Professor Guba's student days--with the current feminist and literary criticism vocabulary. There are useful insights in such vocabularies, but Guba and Lincoln themselves acknowledge a link to an earlier "paradigm." Their validating frontispiece quote of Jefferson is noteworthy:

I know of no safe depository of the ultimate powers of the society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion.

Jefferson, Letter to William Charles Jarvis, September 28, 1820.  
(Guba and Lincoln, 1989)

Compare this with a passage from Mao's "Little Red Book":

In all the practical work of our Party, all correct leadership is necessarily "from the masses, to the masses". This means: take the ideas of the masses (scattered and unsystematic ideas) and concentrate them (through study turn them into concentrated and systematic ideas), then go to the masses and propagate and explain these ideas until the masses embrace them as their own, hold fast to them and translate them into action, and test the correctness of these ideas in such action. Then once again concentrate ideas from the masses and once again go to the masses so that the ideas are persevered in

and carried through. And so on, over and over again in an endless spiral, with the ideas becoming more correct, more vital and richer each time. Such is the Marxist theory of knowledge. (Tse-Tung, 1967, 70)

Mao mentioned a spiral, and I envision a spiral, yes, but actually a shrinking spiral, like water going down a drain. The ideological vocabulary shrinks until it converges. The speaking options of the people become more limited as they develop a common vocabulary. Is this the discovery of truth or mere propagandistic mastery of a population? And in this sense, is not consultation, from "talking" psychotherapy to Guba and Lincoln's evaluation, basically the reflection and reinterpretation of another person's vocabulary?

#### 5.2.2 From Scientific Inquiry to Generic Knowledge

Scientific inquiry also can be envisioned as a shrinking spiral of confirmed knowledge, which can become the "generic," that is, generally accepted, knowledge of science. Later, I will propose a kitbox of generic "tools"-- tables, graphs, spreadsheets, etc., for housing policy analysis.

Organized "generic" knowledge of science can sometimes reveal the distortions of ideology, or at least provide a counterweight.

Despite misgivings about its limitations in the policy arena, we sometimes cling to science as to Queequeg's floating coffin. The ideological seas are rough with raging Ahabs and White Whales hunting each other down, obscuring truths about public policies amidst briny spray and screaming partisan gales.

It is difficult to improve on the old "observe, judge, act" model for prudent judgment. In fact, the "moving toward" component of my inquiry using formalized common sense corresponds to "observe," while the "moving away" and "moving against" steps provide a bridge between judgment and action.

"Observation" and "Analysis" form the bridges between qualitative and quantitative induction. Were categories "say" (tell others or not tell others) and "tools" (available or unavailable) added to the Know-Do Matrix, other commonsense propositions on public action would be revealed. The process of passing through from common sense to formalized common sense beyond propaganda to problem-solving is not random. There are certain predictable interactions of these areas which we can anticipate. The "say" dimension could help us to understand the interaction of the other categories with propaganda. The "tools" dimension could outline commonsense propositions on whether a policy has enough resources behind it to succeed. While this current work will not directly consider these dimensions of formalized common sense, they are looming in the background of our discussion. The Know-Do Matrix can be used for probing action and probing knowledge.

Using a future Know-Do-Tools-Say matrix, a pathway can be developed from common sense to formalized common sense through propaganda to problem-solving. The impenetrability of bureaucracy confounds common sense. These tools formalizing common sense can help force irrationalities into the open.

### 5.2.3 Using the "Directions" for Argument

The process of "refuting" the old common sense, however, is a much more supple affair.

Since argument depends on what one's disputant happens to have said last or is about to say, the use of the "directions" of common sense for argument is not invariant, but depends upon the nature of the *perceptual certainty* to which one's disputant appeals. An argument hops around directions of moving "toward, away, and against" as the dialogue progresses, depending on the topic addressed. This can cause confusion, especially when one argues "within" inquiry. But the experienced *rhetor* finds that gaining a sense of where one stands in relation to the commonsense directions of the question at hand is the essence of her or his art.

Once in the open, our abduction often enters the picture and quick decisions are made. But what happens when the choice is more of a considered one? For this we must consider the question of judgment itself.

### 5.3 Judgment in the Context of Common Sense

#### 5.3.1 Yves Simon on Judgment

In formalizing common sense as analysts and planners we get clues to what Yves Simon called judgment. Linked as it is to action, "ultimate practical judgment" has the "character of a command" (Y. Simon, [1961] 1988, 386). This command is to ourselves to act.

The practical judgment, according to Yves Simon:

whose proper perfection is truth by agreement with right desire, is ultimately determined not by cognition but by inclination, and its determination is certain if the inclination which ultimately determines it is right. Any decision of great consequence, if it is made in the midst of particularly obscure circumstances, is accompanied by the realization that all the reasons adduced are insufficient. . . . The practical judgment is, within our familiar experience, the most certain as well as the clearest case of affective knowledge. . . . Inasmuch as the ultimate practical judgment admits of no logical connection with any rational premises, it is, strictly speaking, incommunicable. . . . We frequently experience the contrast between knowing enough to *do* what we have to do and knowing enough to *understand why* this is what we should do. (Y. Simon, [1961] 1988, 394-399)

Yves Simon was writing, of course, of individual practical judgment. Sometimes it is very difficult for one person to explain to another, for example, just why one turned down a particular business venture with one partner and chose another venture with another. Analysts and planners make quick decisions about which information to take at face value and which to doubt and to probe. Let us look at the judgment of planners for a moment and then come back to the question of judgment and common sense.



### 5.3.2 Gerald Suttles on the Reasoning of Land-Use Planners

Sociologist Gerald Suttles, after a few years observation among downtown Chicago planners, concluded:

It was as I branched out from the downtown projects to examine those along the North Side that I realized that even the most knowledgeable Chicago "land-use watchers" (by now I knew that there were thousands of them) could not articulate the reasoning behind their deliberations. What they knew, even when they pooled their intelligence, was essentially a set of scattered observations enriched by daily experience. It was "only" a kind of lore or craft knowledge, and it lacked conviction unless they had some of the same experiences. Ten really seasoned Chicago land-use observers could meet for forty-five minutes and quickly reach agreement or disagreement on the worth of some new project for the city. What would inform their decision would be 100-200 years of land-use experience. They could quote from innumerable cases and bring to bear crucial comparisons. But, essentially, they had to fall back on the claim that "we know, because we have been there." (Suttles, 1990, 282)

I am convinced that Suttles and Yves Simon described a similar process of judgment, in the case of local planning common sense judgment informed by *historia* within the craft of Chicago downtown land use practitioners.

I am also convinced that in the background of such personal judgments relating to public policy are either:

1. commonsense propositions, or
2. consciousness about forces of power and influence, or
3. both

which predispose us to make the kind of professional public policy decisions which we make.

### 5.3.3 From Franklin to Deming: Examples from the Literature of Self-Help

One great source for uncovering commonsense propositions as decision rules for judgment is that most Yankee of genres, the literature of self-help. Presently standing on each end of this literature are statesman, printer, and scientist Ben Franklin and quality management

statistician and guru W. Edwards Deming. Both have compiled a mix of scientific rigor with a treasure-trove of typically self-contradicting commonsense propositions which nevertheless have been honed by the practicality of senectitude into bits of very applicable and profitable wisdom. The question is, in which context do we apply their wisdom? On this there are difference schools of interpretation, weaving from the same commonsense propositions different stories.

From Dr. Franklin we gain the method, echoed in a notable Jackie Gleason *Honeymooner's* episode, of making a list of our strengths and our weaknesses and of building upon our strengths while diminishing our weaknesses.

From Dr. Deming comes the ideas of understanding the meaning of variation of performance in human systems, of deciding, ala the "other" Pareto principle more familiar to businessmen than scientists, that 20% of a given population might be responsible for 80% of variation in performance, and advice on where to intervene without making the situation worse. Underlying Dr. Deming's business interventions is something of a *primum non nocere* principle, "first do no harm," drawn from the wisdom of the disciples of Aesculapius. Running through Deming's approach is also a skepticism about measurement itself, holding that sometimes the really important things are the things we cannot measure (Deming, 1982). Deming's Fourteen Points are designed to increase cooperation among workers and managers as they work together toward continual improvement of quality of product and workplace while collecting the most useful and accurate information possible.

The commonsense propositions collected by Dr. Franklin and Dr. Deming can be viewed as a compendium of contextual decision rules for human affairs. Often, when we are pressed to explain why we made a given policy judgment or recommendation, we draw from aphorisms--commonsense propositions--to communicate our reasoning. We cannot get inside

the human mind to explain this reasoning. But we can draw inferences, as Herbert Simon does with his "protocol analysis" the *outputs*, of this reasoning (Ericsson and Simon, 1984). My short cut for public affairs is to use a knowledge of commonsense propositions to get handles on policy judgment.

#### 5.4 Commonsense Proposition as a Working Proxy for Judgment

My notion of "commonsense proposition" serves as a working proxy for the affective decision process Yves Simon described, and its "irrational" component. If we wring all the irrationality out of our understanding of decision making, our model might suffice in the lab but might crash and burn in daily practice. People decide things for their own reasons, not all of them easily communicated or understood. Unable to answer definitively the question why this is so, I am content to uncover "commonsense propositions" and work with them, against them, and around them.

It is my contention that "boundaries" to rationality are not only limits to information and to time, but also moral limits. When human lives lay in the balance, formal moral questions tip purely rational scales. The economist answers, fine, but how do you make sure your "moral" decision won't make things ultimately worse? The answer to this question involves the development of a method that can help us answer "large" public questions like that of the Mortgage Interest Deduction, as opposed to "smaller" public questions on the scale of whether to build the bridge or the incinerator. Let us proceed along our line of inquiry as we develop such a method.

#### 5.5 Adding Action "Directions" to the Know-Do Matrix in Action

An interesting thing occurs when the "directions" of "toward," "away," and "against" are added to the Know-Do Matrix. We succeed in "reinventing" the wisdom of public managers.

Few public managers do not begin their tenure:

- without pledging to work to minimize theft (*against* commonsense akrasia);
- without assuring the public of no policy surprises (*toward* rational expectations);
- without attempting to rationalize the operation (*away from* chaos); and
- without some degree of public education (*away from* dumb luck).

These are long-term goals which seem to remain within government bureaucracy as almost constitutional basics, although they are not mentioned in the constitution. Where do they come from? They seem to make good sense. It flies in the face of common sense not to do them. They possess a certain moral certainty, and have the force of accumulated wisdom behind them. In my opinion they come from common sense. We now have a way of systematizing them so we do not miss them.

The following table translates the above sentence about the pledges of the commonsense administrator into terms of the Know-Do Matrix.

TABLE IX  
KNOW-DO MATRIX REVISITED

Aggregated Decisions

	KNOW	DON'T KNOW
DO	Rational Expectations <i>Harness</i>	Dumb Luck <i>Make Smart</i>
DON'T DO	Akrasia <i>Minimize</i>	Chaos <i>Bound</i>

The most successful strategy facing rational expectations seems to be to move "toward" *rational expectations* and harness its force. You can't lick it, so join it. Little can be done about *dumb luck* except to build information feedback into a system so that we can learn to do things, as Hamilton expressed, not by "chance" but by "choice." We "work smarter, not harder" as W. Edwards Deming (1982) puts it. We move "away" from *dumb luck* but not "against" *dumb luck*. We take a similar approach to *chaos*. We try to move propositions out of the *chaos* box into the *rational expectations* box. As for *akrasia*, we move "against" it.

These are by no means the only possible combinations of "directions" and the Know-Do Matrix. But it is interesting that the commonsense propositions about action derived from this exercise are those espoused by administrators perennially.

[One aside here. I have recently begun examining whether Deming's (GAO, 1990, 46) recent "System of Profound Knowledge for Management in Industry, Education, and Government":

- Develop an appreciation for the importance of having a system in place.
- Develop an understanding of the theory of variation.
- Develop a practical theory of acquiring and using knowledge gained from outside sources.
- Develop an understanding of psychology.

is a response to the different problems of inquiry represented by commonsense propositions of the Know-Do Matrix. That Dr. Deming would arrive at this point after 92 years of inquiry is quite demonstrative.]

#### 5.5.1 Incrementalism with a Twist

To contrast this "action" approach with the notion of "directions" in "inquiry," however, a more systematic consideration of the "three directions" and the Know-Do Matrix is required.

One "directions" strategy of inquiry could be: consider each "box" for as many of the "directions" are necessary to inform one's decision whether to keep or eliminate the particular "box" as a possibility. Like Sherlock Holmes, we "Eliminate the impossible, and whatever remains, however unlikely, is the truth" (Doyle, 1938; Blanco, 1989). This we will do for the question of the Mortgage Interest Deduction.

Such a "formalized and accumulated common sense" approach to public action based in anticipatory inquiry allows us to move quickly in a key direction when public opportunities present themselves. This is, as I described it, "incrementalism with a twist." The "twist" is: preparation. We probe so thoroughly around a policy question that when a policy window opens, we know if we want to jump through it, and how quickly, and carrying what.

Once we prepare ourselves using the short-cuts of the "directions" of inquiry, argument, and action, we must then exercise judgment.

Commonsense judgment can sometimes very quickly perform the "Sherlock Holmes" elimination of the impossible. But how it does it involves a form of educated guessing called *abduction*, the definition of which American philosopher Charles S. Peirce considered for the greater portion of his life.

#### 5.6 Abduction and Research Programs

Abduction is important for understanding and developing strategies for tapping and refuting common sense in the public problem solving arts, the day to day practice of which are only in part based upon positive science. Abduction, being the process of forming hypotheses, conforms more closely to what a policy actor does. There is often no time to stop and prove items beyond shadow of a doubt by building a policy "weather station" and linking it to a policy "war room." More often, the problem solving strategy of public problem-solvers reflects the words of the old song, "Accentuate the positive, eliminate the negative, don't mess with Mr. Inbetween."

### 5.6.1 Abduction Defined

The OED defines abduction as "A syllogism, of which the major premise is certain, and the minor only probable, so that the conclusion has only the probability of the minor; apagoge."

While Peirce's ideas went through at least two phases over his more than fifty years of effort (Fann, 1970, 5), Blanco's (1989, 264) summary of his definition of abduction is generally accepted:

1. Some surprising phenomena P is observed
2. P would be explainable as a matter of course if hypothesis H were true.
3. Hence there is reason to think that H is true. (Peirce, 1958, 5.189)

Note here that the Peirce citations list volume and page of the cited edition of his collected works.

Abduction differs from both inductive and deductive reasoning:

Abduction invents or proposes an hypothesis; it is the initial proposal of an hypothesis on probation to account for the facts. Deduction explicates hypotheses, deducting from them the necessary consequences which may be tested. Induction consists in the process of testing hypotheses (Fann, 1970, 10).

In Peirce's own words:

Abduction is the process of forming an explanatory hypothesis. It is the only logical operation which introduces any new ideas; for induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis (Peirce, 1958, 5.171).

The tasks of logicians, according to Peirce, are principally two:

1. To bring out the amount and kind of *security* (approach to certainty) of each kind of reasoning, and
2. To bring out the possible and esperable uberty, or value in productiveness, of each kind (Peirce, 1958, 8.384).

Fann put it succinctly:

Abduction is concerned with the reasons for adopting a hypothesis. The adoption of a hypothesis on probation cannot properly be called induction; "and yet it is *reasoning* and though its *security* is low, its *uberty* is high" (Peirce, 1958, 8.388). Thus from deduction to induction and to abduction the security decreases greatly, while the uberty increases greatly. (Fann, 1970, 8)

Again, Fann:

What does abduction consist in? Is it the logic of constructing a hypothesis, or the logic of selecting a hypothesis from among many possible ones. At the outset these seem to be two entirely different questions, but, as we have shown, in practice they are analogous to one another. *The central problem of abduction is to analyze the conditions or the criteria for the best hypothesis* [emphasis added]. (Fann, 1970, 59)

Peirce names three main considerations that should guide our choice of a hypothesis:

1. A hypothesis must explain the facts at hand.
2. It must be capable of being subjected to experimental confirmation.
3. It must be guided by economic considerations.

#### 5.6.2 The Link Between Peirce and Refuting Common Sense

Fann (1970, 38) highlighted another one of Peirce's key distinctions, that between *logica docens* and *logica utens*. Peirce's *Logica docens*, according to Fann, is "formulated, scientific, and critical logic." Peirce's *Logica utens*, on the other hand, is the "acritical and implicit logic of the common man" (Fann, 1970, 39).

Key to this argument is Fann's summary:

Thus, by our *logica utens* we are able to guess right in many instances. This ability, as suggested in the previous section, may be regarded as the result of adaptation of the mind to the universe. But, where our instinctive reasoning power begins to lose its self-confidence, as when we are confronted with extraordinary and unusual problems, we look to the help of our *logica docens*.

Peirce warns, however, that we should not expect the study of logic to supply an artificial method of doing the thinking that our regular business requires us daily to do (2.3), and suggests that "The best plan, then, on the whole, is to base our conduct as much as possible on Instinct, but when we do reason to reason with severely scientific logic" (Peirce, 1958, 2.178).



Peirce's "acritical and implicit logic of the common man" only turns to scientific reasoning when acritical logic fails. I agree with Peirce in assuming that our day to day reasoning only turns to scientific reasoning when presented with a surprising problem that our previous store of knowledge (some of the store being the result of previous scientific inquiry stored as predispositions) fails us.

### 5.6.3 Peirce's Varieties of Abduction

Fann drew from Peirce two principal kinds of abduction:

1. *constructive* and
2. *selective* abduction,

the first being the creation of hypothesis, the second the choice of one hypothesis from among many.

In Peirce's own words:

The first starting of a hypothesis and the entertaining of it, whether as a simple interrogation or with any degree of confidence, is an inferential step which I propose to call abduction. This will include a preference for any one hypothesis over others which would equally explain the facts as long as this preference is not based upon any previous knowledge bearing upon the truth of the hypotheses, nor on any testing of any of the hypotheses, after having admitted them on probation. I call all such inference by the peculiar name, *abduction*. . . . (Peirce, 1958, 6.525)

### 5.6.4 Umberto Eco's Varieties of Abduction

The popular Italian philosopher, novelist, and literary critic Umberto Eco distinguishes four kinds of abduction, which bear great similarities to the phrases following them in parentheses:

1. overcoded abduction (Peirce: selective)
2. undercoded abduction (Peirce: constructive)
3. creative abduction (Peirce: constructive; Lonergan: insight)
4. meta-abduction (It seems obligatory to have a "meta-" whatever. "Meta-abduction" for Eco has a communication aspect. I find this variety of abduction similar to marketing, or rather merchandising one's ideas). (Eco, 1983; Blanco, 1989, 272)

### 5.6.5 Blanco and Creative Abduction

Hilda Blanco (1989), in her thesis on abduction in planning practice did not dwell upon *selective* abduction, but upon *creative* abduction, and while she drew upon Fann, she concentrated upon the usefulness of creative abduction for dealing with what has come to be called *wicked* problems, a term coined by West Churchman in a early 1960's Berkeley seminar to describe certain planning problems with:

no definite formulation, no stopping rule, solutions neither true or false but good or bad, no immediate or ultimate test of solutions, and so on. (Blanco, 1989, 261)

My method differs from Blanco's in that, while I acknowledge the importance of *creative* abduction, I believe that the history of housing policy demonstrates, as we shall see, that the public response to *wicked* problems tends to be institutional rather than based upon individual insight. Institutions and organizations grow in response to *wicked* problems, attempting to "chip away" or "capture" them, and thus turn the necessity for *creative* abduction of the charismatic innovator into the routine *selective* abduction of the institutional employee.

This latter, selective kind of abduction resembles the kind of reasoning Ivan Illich (1970, 1981) termed "Epimethean," after the mythical Greek titan Epimetheus. Illich contrasted Promethean (from Greek, "forethought") approaches with Epimethean ("afterthought") ones, and posited an Epimethean approach as preferable.

#### 5.6.5.1 The Lack of Proof for Abduction

It must be acknowledged early on that abduction belongs to the application of "art," as we have been discussing it, rather than science. There is much disagreement over the scientific basis for abduction:

This failure to provide an independent justification for abduction remains a difficult problem for contemporary philosophers who maintain that there is a logic of discovery. (Fann, 1970, 54)

This failure to justify abduction involves the necessity to use introspection to understand abduction in the first place. Lonergan ([1958] 1978), as we have seen, undertook the task of

studying the logic of discovery in his *Insight*, and the "protocol analysis" of Ericsson and Simon (1984) is a similar attempt to develop a science of systematizing introspection.

Within such public contexts where we acknowledge that we make educated guesses and admit that we "abduct," it is difficult to "make sense" to others about the advisability of our recommendations. But we must try.

#### 5.6.6 Again Taking Stock

In considering policy judgment, we have explored:

1. how we can use commonsense propositions, and view them from different angles or "directions," and thus gain clues to alternative judgments pertaining to public policy, and
2. how we abduct, or make educated guesses about, a list of alternatives, and how this pre-scientific form of reasoning can play an important part in the process of policy inquiry.

We now continue discussing the second of these.

#### 5.7 Integrating Commonsense and Scientific Knowing in Policy Analysis

During the preceding chapters I have "turned up the volume" on what heretofore has been the "background music" to policy analysis. We usually think of policy analysis's scientific component as the "melody" or "lead" section of the policy orchestra, and other forms of reasoning and inquiry as "background." If you turn up the accompaniment, you can better understand the structure of the music. The "science" portion of policy analysis has long been in the foreground. We have just spent time considering the "guessing" or "judgment" portion which also make up the complex sense of certainty we have about our policy choices.

Since public policies are maintained by complex forms of public certainty involving law, power, and propaganda, policy analysis must address these complex forms of certainty with

complex forms of certainty of its own. Public policy analysts and planners must incorporate both scientific and common sense knowing into their approach to social choice and social action. Of the many possible ways to do this, I propose the method of formalized and accumulated common sense. This approach, following Hemmens' distinction between the "projection" and "recollection" models of planning, helps us to translate scientific knowledge into the common sense of social actors, and to validate their common sense with scientific instruments. When I speak of "social intuition," I refer to this composite of social choice and social action, and not merely to educated guessing.

This is, it is hoped, a useful attempt to help counteract the pitfalls of utilitarian based planning: what little you know about the future, marginal or peripheral though it might be, tyrannizes your choice process because it is the only certainty at hand. It is in this situation that Goethe's aphorism, "Vernunft wird Unsinn," or "Reason becomes madness" is borne out. Or Chesterton's "Virtues gone mad" does just as well. Utility must be surrounded by intentionality and context. These provide boundaries within which we can make policy choices which actually might work.

To cap off the metaphor of common sense as background policy analysis music: every composer knows that he or she must listen closely to the background music--to turn up its volume--in order to write it. The policy analyst, in the course of his or her work, must be capable of playing each part both softly and loudly, and then must choose the proper volume for each part of the ensemble. If this balance is not achieved, then the analysis does not "make sense."

The phrase, "policy and planning *practice*," usually denotes for us the activity of policy and planning. But the method of formalized and accumulated common sense also involves the "practice" we do before we put our ideas "into practice." A musical piece, practiced by one

hand's part individually, is of course only a partial and distorted version of the final piece put into practice. But how much better the finished playing sounds if such practice is done.

The planner and policy analyst can use the method of formalized and accumulated common sense to convince him or herself and his or her colleagues of the appropriateness of a course of action. This convincing involves building a complex sense of certainty about a given policy option. Communicating this complex sense of certainty we call "making sense."

#### 5.8 On Sense and Common Sense in Public Policy Analysis.

##### 5.8.1 On Making Sense

Analysts and planners must "make sense." What does that mean? To make sense in public policy analysis, we must address the complex sense of certainty, the common sense, of our audience. One way of "making sense" in public policy involves constructing a story, composed of both refuted and unrefuted commonsense propositions, which addresses as many aspects of certainty as is possible.

##### 5.8.2 On Making Sense Common

Translating this complex bundle of certainty into visual and verbal forms which can be understood and shared by others is the next step. We must communicate this complex sense of certainty, and we often must refute the existing common sense.

##### 5.8.2.1 Live Versus Dead Facts.

A word is in order here on some pitfalls related to this communication, this "making sense common."

Ever since I began studying legislative reforms twenty five years ago, I noticed that not only were similar laws attempting similar ends enacted decade after decade in many areas such as child care, prison reform, mental health, and housing, but that reports of experts, compiled with great fanfare, lay by and large dead on the shelves. While enhancing the

reputations of their writers in institutions of ideas and sometimes of politics, their suggestions were ignored unless they could be translated into the common sense tongue, and unless, of course, someone dared to try them. Sadly, it seems formal reports are used as often to defuse and to delay as to guide and to act.

Dr. Franklin's aphorism, "Write with the learned, speak with the vulgar" addresses only part of the problem of public policy analysis and common sense. While it is necessary to present proposals in pithy words if one is to persuade, proposals must make intuitive sense to voters, and must stand some chance of working if approved.

### 5.8.3 On Making Common Sense

If these visual and verbal forms succeed in communicating the certainties of the "story," the images and sayings shared can "take on a life of their own," gain currency in unpredictable ways, and can eventually "come around" and contradict the very propositions which began the process. We are, after all, human beings with minds of our own, and one person's "story" can combine with another's into something which none of us anticipated. The "story" of a person or group can change sometimes daily, so it is quite important to know what a particular "story" is saying in a particular context. For this, the method of formalized, accumulated common sense provides important clues by allowing us to begin categorizing commonsense propositions.

### 5.9 What We're Doing Here

My method looks at the "data" of commonsense propositions as they appear within the context of a public problem.

In the case of long-term institutional questions like the mortgage interest deduction, however, a more systematic approach is required in order to address or refute the commonsense propositions of citizens and public actors. The Know-Do Matrix can be used in

many ways, such as analyzing individual and group actions, but it is used in this context as a variant of "protocol analysis" suggested by Ericsson and Simon (1984).

We examine the verbal output that comes from individuals and groups "about" housing policy. These propositions can be classified according to the assumptions of the Know-Do matrix. This method is similar to "traffic analysis" (Kahn, 1991) in code breaking: we don't know exactly what the messages mean but we know where they're coming from and going to. It is thus possible to infer other things about them. This notion that we are viewing propositions as outputs is quite important when considering the "three certainties."

The plan for the next chapters brings us from crude, to qualitative, to quantitative induction about housing policy. We will move toward common sense, away from common sense, and against common sense as we do this. We will identify the stories of housing policy, consider them according to Peirce's idea of *economy of research*, and consider empirical measures for the question at hand, the Mortgage Interest Deduction (MID).

#### 5.9.1 Peirce on Economy in Research

Peirce's concept of economy in research is as important as abduction to this discussion. Economy

treats of the relations between utility and cost. That branch of it which relates to research considers the relation between the utility and the cost of diminishing the probable error of our knowledge. Its main problem is, how, with a given expenditure of money, time, and energy, to obtain the most valuable addition to our knowledge. (Peirce, 1958, 7.140)

This commonsense passage echos in Herbert Simon's "satisficing" and in the economy of ideas of cost-benefit analysis over a half century later.

Peirce listed three economic factors, according to Fann, that should be considered in abduction:

1. the cost of verifying the hypothesis,

2. the intrinsic value of the hypothesis proposed, and
3. its effect on other projects. (Peirce, 1958, 7.220; Fann, 1970, 48)

There is one problem with using economy of research in public affairs: your research must be economical, but your preparation must not. To be capable of economy of research, one must thoroughly know the field. In the case like the Mortgage Interest Deduction which is wickedly embedded in housing policy, requiring a change in a complex form of certainty, we must build a map of this complex certainty first, so that then we can use the short-cuts.

#### 5.10 Wrap-Up

This chapter explored questions relating to how we convince ourselves regarding public questions of planning and policy. Considering the work of Charles S. Peirce, of Yves Simon, of W. Edwards Deming, and of Herbert Simon, I attempted to lay the groundwork for further policy inquiry.

By mixing "directions" with the Three Certainties and the Know-Do Matrix, I have begun to develop short-cuts to comprehensiveness in how we individually reason and judge about public inquiry, argument, and action, and how we use formalized and accumulated common sense to build and reinforce our own complex sense of certainty about public questions.

The next step is to convince others, to get them to change their own complex sense of certainty. Key to public action is argument, for it holds the key, short of manipulative power, to changes in our complex certainty about "what works here." We next consider what it takes, short of power or coercion, to refute this complex sense of certainty.



## REFUTING COMMON SENSE--CONVINCING OTHERS

This chapter considers the refutation of commonsense forms of certainty. Particular examples drawn from the commonsense propositions associated with the Know-Do Matrix will be treated, along with general notions of refuting commonsense propositions with moral, demonstrative, and perceptual components.

Since my emphasis throughout this work has been on "portable" tools for public problem solving, I propose one method of commonsense refutation based upon:

- moving *toward* common sense (*perceptual*);
- moving *away from* common sense (*moral and demonstrative*); and
- moving *against* common sense (*perceptual* again).

Altering common sense is a chancy proposition. Refuting common sense is much more difficult. Yet short of brute physical, political, or economic coercion, public change is associated with some change in common sense, especially the sense of "what works here" when something most people thought could not get done gets done.

"Refuting" each quadrant of the Know-Do Matrix provides a convenient method for refuting common sense. The art of this refutation is an essential art for technicians in the public sector.

### 6.1 Refutation Defined

What do we do when we refute something? One simple way to define refutation is to say that refutation is convincing someone that something *isn't*, or it *doesn't*, or it *can't*. In some cases, it is possible to say, "*It's wrong.*"

### 6.1.1 It Isn't.

The *it isn't* refutation argument can be used in two key ways. You can argue that something doesn't exist, or you can argue that it is really something else. The latter argument is more persuasive, since the "something else" remains around to remind us of its existence, while something's "non-existence" could be contradicted by it showing up all of a sudden. Non-existence can only be proven using demonstrative certainty, while "something elseness" can not only be proven with demonstrative certainty, but also with perceptual certainty.

### 6.1.2 It Doesn't

Saying something is not presently doing what it is supposed to be doing is another form of refutation. Again, the arguments and the forms of certainty drawn upon are similar to the previous case. You either demonstrate that a thing is not doing anything at all or that it is really doing something else.

### 6.1.3 It Can't

Proving that something can't do something involves proving that it can't do anything, or much observation over time can prove it mostly does something else. The forms of certainty drawn upon are similar to the two previous cases.

### 6.1.4 It's Wrong

Another form of refutation involves moral certainty. If you can prove that something or course of action leads to something that is morally abhorrent, then there is little necessity to prove it is or isn't anything else.

### 6.1.5 Refutation Can Translate Common Sense to Science

Some of the greatest refutations of common sense in modern science involve proving that commonsense propositions about one set of assumptions are really based upon scientific logic springing from another set of assumptions. Thus when Arrow proved that desirable

individual choices sum to choices undesirable for a group, he proved that something that looked like akrasia was really more rational than it appeared, and, to use our terminology belonged not in the Akrasia box of the Know-Do Matrix but in either of the boxes of the top row of the Matrix.

Once we can determine rationality, we can make predictions. And once we can make predictions, it is sometimes useful to assume perfect foresight. In so doing we move commonsense propositions from, say, the Akrasia box to the Rational Expectations box.

## 6.2 Common Sense as a Complex Form of Certainty

Public actors sometimes have the opportunity to choose whether to harness the power of common sense or to change it. By refuting or changing common sense we change a complex form of certainty. It is often a composite of perceptual, moral, and demonstrative certainty. Consider the premise of the archetypical TV commercial for medicine, were it in this case to be performed by the comedian, Mr. Subliminal:

- "I am not a real doctor, but I play one on TV (better than real)" (Moral certainty established).
- "Nine out of ten doctors (from soap operas) stranded on desert islands recommend aspirin for aches and pains commonly associated with desert islands" (Demonstrative certainty established).
- Action: *Patient with pounding headache takes medicine (happy, happy) gets new hairdo, clothing, makeup, contact lenses, lighting, family, helicopter ride off desert island, etc.* (Perceptual certainty established).
- Tiny letters on bottom of screen: *Use only as directed. Void where prohibited, etc.* (sounds like real doctor disclaimer, more moral certainty).

It is not accidental that many commercials attempt these three aspects of certainty, for these "three certainties" help us weave together our own commonsense composite of certainty.

The task of the public problem-solver involves not only technical policy research with a potential for demonstrative certainty, but professional and interest group affirmation of the findings (potential moral certainty), and effective graphic and or verbal communication of the findings (potential perceptual certainty). In the latter case, the "typical American family" is often appealed to, e.g., "The average wage earner would lose \$2,000 in disposable income under Senator Flim and Congressman Fiam's proposal."

### 6.3 Some "Postulates" of Common Sense

Before we proceed we need some working assumptions to build a model for the refutation of common sense. To do so, I herein propose a "Postulate" of Common Sense: that **those scientific or philosophical ideas endure and persuade which can be successfully translated into commonsense propositions.**

Milton Friedman will be remembered for, "There's no such thing as a free lunch." Freshman Kantians learn the Categorical Imperative as, "What if everybody stepped on the grass?" Vilfredo Pareto's improvement will be known as, "Make somebody better off without anyone being worse off." On the other hand, John Rawls's objections to Pareto, lacking in "translatability" to common sense, will be overshadowed by the first really good commonsense objection to Pareto that comes along.

A first corollary to this postulate is that, **if a commonsense proposition can be mathematically or graphically expressed, it will drive out propositions which cannot.**

A second corollary is something of a common sense inertia postulate: **Policy actors tend to follow their own common sense unless it is persuasively contradicted by another common sense.**

A third corollary is, **contending commonsense propositions coexist in popular culture**. Men and women who think through their entire world view, as the nation witnessed, for example, in Judge Robert Bork on the one hand and Professor Laurence Tribe on the other, are relatively rare. Most of us, I assume, pull together practical, "school of hard knocks" wisdom from many sources. It will thus not be surprising to find a person, whether that person be a carpenter or congressman, quoting both Marx and Milton Friedman in the same conversation. "If you don't work, you don't eat" could be Stalin or St. Paul, and the conversation might end with Dr. Friedman's line about the free lunch.

The world of citizens and their discrete choices is a teeming bazaar of conflicting common senses and certainties. The attempt to sort through this bazaar and improve our society brought about the discipline of planning, in whose frame we can situate purposeful public action amidst contending certainties.

The twentieth century began with the great contribution of Vilfredo Pareto to public decision making, the concept of what we call Pareto efficiency, which we can translate into a commonsense proposition: "Make somebody better off without making anybody worse off." When combined with the Cartesian graphs of welfare economics, Pareto efficiency propositions can communicate both *demonstrative* and *perceptual* certainty, providing the basis for its great power.

#### 6.4 The "Just War" Theory of Economics

Let us now consider questions of certainty associated with the Pareto commonsense proposition.

Vilfredo Pareto's famous criterion of optimal economic distribution arose in reaction to earlier, theologically based, concepts of justice. These earlier concepts provided moral principals, based in scholastic theology, for the making of moral judgments for "big" social

decisions. The most famous of these is the "Just War" Theory, derived by Augustine of Hippo and modified by Aquinas, which provided a series of "tests" upon which the morality--and advisability--of warmaking could be judged.

I propose extending the metaphor of the just war theory into questions of national economic consequence. My principal reason for doing so is a practical one. Even if Pareto efficiency persuades the technicians, it often does little to persuade the citizens. The taxing of imputed rental income from one's own house, the technical economic arguments for the closing of particular military bases, the extensive economic studies done of the practicality of housing vouchers--all these continue to be thoroughly studied. But the application of these ideas necessarily leads to conflict and often leads to their rejection.

No matter how many times they might be defeated, some policy proposals refuse to die. In tax and in housing policy, several perennial proposals rise only to be soundly trounced in Congress each time they are proposed. Yet again and again, whether for reasons of equity or of finance, enough public support for their hearing builds, a vote is taken or not taken, and the issue is again set aside.

Some such recurrent policy proposals call to mind the Warner Brothers' "Tweety Bird" cartoons, for there, in a seemingly very permeable cage sits a fat little bird ready to be snatched by hungry Sylvester the Policy Maker. One quick jump in policy and the little bird will be dinner, thus soothing a nagging hunger. But no sooner does Sylvester the Policy Maker jump, but he is bitten by bulldogs, run over with grass cutters, beset with steamrollers and other heavy construction equipment, plugged into electric sockets, pounced upon by kangaroos, and mailed parcel post to Antarctica, where he is tossed into the frozen sea, weighted down by anvils, safes, and pianos. Seconds later, with singed whiskers, a flattened tail, and frozen in an iceberg large enough to sink the Titanic, Sylvester returns to try again.

Newspaper editorials abound with Tweety Bird policy proposals, which could be implemented--if only taxpayers were not taxpayers, unions were not unions, politicians were not politicians, lobbyists were not lobbyists, and editorials were as thunderbolts on the road to Damascus. Among such policy proposals recurring in the housing sector are the suggestions that manufactured housing would solve the shortage of affordable housing, that the imputed rent earned by homeowners should be taxed, that all public housing high rises should be blown up and replaced with low rises, and that the Chicago building codes should allow PVC plumbing pipe to the degree allowed in other cities in the country. These quotidian proposals are not necessarily bad ideas, but votes are rarely garnered or money raised to effectively legislate them. We must begin to frame our proposals differently.

The global questions of the just war theory--is there imminent danger, is our use of force proportionate to the threat against us, did we exhaust all other means prior to our use of force, will conditions be better off after the war, etc.--are commonsense questions that an individual person would ask him or herself when faced with violence. This commonsense aspect gives the just war theory persuasive power. Although there was vigorous disagreement in the United States over the Persian Gulf War, the just-war questions, aired in Congressional and local debates, led to the forming of a decision on the matter of war-making, however nagging the questions remain after the decision.

The decision, made in the eyes of the citizens, was not one made along Pareto-optimal lines. In fact, the Pareto-optimal method seems only to address one of the questions that citizens have--will we be better off or worse after this is over?

For enormous decisions like the alteration of the mortgage interest deduction, more questions, analogous to the just-war questions, must be addressed if any public consensus on the matter is to be achieved:

1. What's so harmful about it now? Is it worth going to political war over?
2. What means should be used to reduce it?
3. Have all other means been attempted?
4. Is our remedy proportionate to the problems caused by the MID?
5. Will we be better off afterward?

In my opinion, framing the question in this manner, from the very beginning, provides citizens with the commonsense means to make a public decision. Only the first and the fifth question are addressed directly by Pareto optimality, and the fourth indirectly, and such optimality is only a necessary, but not sufficient means to make a public decision.

When reading economic literature, one comes across wistful statements from august figures similar to, "If only we could convince people that this economic truth we've discovered won't hurt them in the long run, we could really improve things." Perhaps, we have not been asking citizens the right questions, and providing them with the answers to the questions which they ask first.

#### 6.5 Whose Life Is It, Anyhow?

Earlier we considered Milton Friedman's "Whose Money?" matrix, which was able to illustrate commonsense propositions about policies while touching on the "three certainties." We now look at a variation on that matrix which will allow us to more closely look at the *moral* certainty question.

On his television program, *Free to Choose*, Milton Friedman described a proposal for the deregulation of ambulances, arguing that bad ambulance companies would quickly be driven out of business. This assumes (1) perfect and readily available information and (2) that the cost in human lives would be minimal, or rather, nonexistent.



As much as I find free market suggestions generally useful, this is one idea that draws the epithet "crackpot" from critical audiences. Experience, it is said, is the most expensive teacher. When human lives are the coin paying the cost of knowledge, a moral dimension, a moral boundary arises in the marketplace and quickly legitimizes local regulation. Consider the following "Whose Life" Matrix:

TABLE X

## THE "WHO SPENDS WHOSE LIFE" MATRIX

YOU ARE THE SPENDER

	ON WHOM SPENT	
WHOSE LIFE	You	Someone Else
Yours	I	II
Someone Else's	III	IV

Note how the addition of the moral dimension, in this case the coin buying information being the human life, changes the considerations drastically. There are circumstances in which one would seriously consider spending one's own life, such as risking transplant surgery for a sick child. But when do we enter the bottom row? Risky necessary surgery upon one's child, dangerous construction projects such as large tunnels wherein loss of life is nearly a statistical certainty, and warmaking are some of the few actions in the bottom row which would ever be legal, if morally justified. When the false move can result in the death of a human being, all sorts of extraordinary cautions are taken.

Milton Friedman, of course, raises a legitimate question: do regulated ambulances save more lives than deregulated ambulances would? Lives, however, will probably never be spent finding out.

Gardner and Ostrom's (1991) article formalizing both *physical* and *deontological*, that is, obligatory, boundaries in political game theory is an effort to model both the economic and moral "rules" by which public actors behave. These are the original components--both economic and moral--of Bentham's utilitarian formulation (Gardner and Ostrom, 1991, 122).

I propose putting commonsense ideas from the "Trust the Market" tradition through both the "Whose Money" and "Whose Life" matrices or other similar tools before we consider them further. This eliminates plausible sounding proposals which overlook impassable moral boundaries.

#### 6.5.1 A Caveat about Mental Schemata

Schemata like the "Just War Theory of Economics" and the "Whose Money" and "Whose Life" matrices are again "convincing ourselves" tools which we must "practice"--thoroughly examine as individual planners or analysts--before we put them into practice "convincing others." Often, these schemas remain in the background, or form and underlying structure for, the arguments we weave into our narratives or depict graphically. Putting them to such "background" use allows our public arguments to be comprehensive without being pedantic. Now we continue considering a number of other schemas that help us to "convince others" on public questions where markets and governments fail.

#### 6.6 Formalizing Nonmarket Failure

Happily, there is a thriving literature on market failure and government intervention, and a growing literature on non-market failure which has proposed decision rules for these circumstances.

Charles Wolf (1979, 1988) stated that although the principal rationale for public policy intervention has been the inadequacies of market outcomes, this rationale is only a necessary, not sufficient condition for policy formulation. "Policy formulation properly requires that the realized inadequacies of market outcomes be compared with the potential inadequacies of nonmarket efforts to ameliorate them."

In the case of the finance of residential housing, a working general theory of market and nonmarket failure with clear policy implications has not been constructed. The four general sources of market inadequacies listed by Wolf:

1. externalities and public goods,
2. increasing returns (effects of monopoly growth),
3. market imperfections, and
4. distributional inequity

--have yet to be unified into working decision criteria for public intervention in private housing markets.

Wolf's four sources of nonmarket failure:

1. internalities and private goals,
2. redundant and rising costs,
3. derived externalities, and
4. distributional inequity

--have also not systematically been unified into working decision criteria for policy implementation and evaluation in the case of residential housing finance. Before coherent public policy can be generated in the case of residential housing, a more thorough understanding of market forces and their relationships to policies is needed.

Because of this uncertainty in policy, I argue that, whatever the government intervention, let it be primarily local, and local government involves local planning. We have local regulation precisely because the market--filtered through the murky glass of politics, especially local politics--has already spoken in favor of it.

Now is this local market wrong? This is where testing the market against the local invisible hand comes in. It is useful to test the regulated market against the free market. But the regulated market should only be freed when a calculation of the potential costs has been made should deregulation fail. We need to speak of the cost of switching from deregulation to regulation and to test whether it is worth it.

The invisible hand has limits. We can begin to speak of where they are. They are on the local level, and are bounded by local considerations, often moral ones. The problem is convincing ourselves, however, that all invisible hands can be discerned in this way. They cannot.

If the "free market" argument passes the "whose life" test, then often the standard Pareto efficient technical apparatus will suffice for testing policy efficiency. Otherwise, the "free market" proposal must pass through the "just war theory of economics" test.

The next test, alluded to in our discussion of Maxwell Street to follow, is: is government intervention, which ultimately involves some form of government planning, proper under these circumstances?

#### 6.7 Science Moves Commonsense Propositions from One Box to Another.

Box Three and Box Four of the Know-Do Matrix, the "lower row," represent areas less prone to quantification than the "Upper Row," wherein the assumptions of economic rationality are easier to maintain. Key insights have come about when thinkers have been able to recast commonsense propositions from the "Lower Row" into "Upper Row" assumptions. What I call

"pseudo-akrasia"--seeming akrasia that masks economic rationality, was successfully "moved" from Box Three to Box Two by Arrow, Downs, and those in that tradition. Currently, research into mathematical chaos is trying to move the commonsense propositions from Box Four into Box One, the Rational Expectations Box.

Now, let us consider refuting individual "boxes" and the problems related thereto. Because common "stories" seem to traverse the Know-Do Matrix in a counter-clockwise fashion, we will too.

#### 6.7.1 Box 2 -- Refuting "Trust the People"

Recent decades abound with serious and costly mistakes which at the time were universally hailed as progress. Asbestos removal from public buildings has drawn billions of dollars away from educational resources especially, yet school boards demanded, indeed, the law sometimes required, asbestos installations. North American downtowns are now engaged in the "de-malling" of their downtown shopping areas, yet hundreds of municipalities had paved their business strips and turned them into pedestrian enclaves in the late 1970's. The public works expense, in concrete and paving materials two times over, is very difficult to calculate. Entire new cities could have been built with the money wasted. In many cases, the elected representatives, indeed, local citizenry and editorialists, sang the praises of the original "mallings" of American downtowns. This, along with the building of high-rise public housing, has been the planning profession's continual embarrassment.

"Trust the people" becomes the chief proposition of the "Wisdom of the masses" tradition. The job of refutation of this commonsense proposition then becomes, "Can we?" "Quis custodiet illos custodiet?"--who will guard those guardians?-- is the traditional phrasing of the "Can we?" question about those representatives chosen through the wisdom of the people.

### 6.7.2 Refuting the Free Market

The principal commonsense proposition of the "invisible hand" tradition is, "Trust the market." The principal refutation of this proposition is to demonstrate that indeed, the market cannot be trusted. This is not an easy task to accomplish.

In 1989 I was "loaned" by the University of Illinois at Chicago to the City of Chicago Department of Planning to assist with planning for the historic Maxwell Street Market, an open air market taking place in a small Chicago neighborhood with a proud history going back to pre-Fire Chicago.

The Maxwell Street Market today involves about 600 (about 800 vendor licenses have been issued--for \$25) individual vendors and 25,000 customers on a summer Sunday. Currently about twenty-two linear blocks are occupied by the Sunday market. Besides two policemen there is little other government presence during the market hours. Vendors have worked out among themselves (from time to time, at gunpoint) their locations. The old world style of bargaining is in effect. For most, the Maxwell Street Market is a colorful part of Chicago lore, a hands-on experience of bazaar style buying and selling from days past.

The principal reason Maxwell Street was being "planned" was that the University proposed expanding into some of the area being used once a week by the Market. The neighborhood which once served as the locus for the Market had been destroyed by the expressway-building, university-construction, and urban renewal process over the past thirty five years. With only a few (less than 10) habitable buildings in the area of the Market proper, somehow the Market still happened every Sunday.

My job was to compile the recommendations of the various local, civic, and professional groups and individuals concerned with the Market into a report (Schorsch, 1989).

The Maxwell Street Market provides a partial vindication for Milton Friedman's ideas. The Market, in many ways, occasionally with violence, does regulate itself. What the Market lacks is ownership interest in the underlying land, provided years ago by the predominantly Jewish tenement dwellers who moved out in the days of Urban Renewal. As a result of the present lack of ownership interest--the City of Chicago and absentee speculators owned most of the land--few in the Market have a vested interest in collecting tons of trash which remain after the Market Day ends. The neighbors and the City must thus spend hundreds of thousands of dollars annually "subsidizing" the cleanup of the Market, from which few taxes are collected.

Milton Friedman quoted Adam Smith, that government has a legitimate duty

of erecting and maintaining certain public works, and certain public institutions, which it can never for the interest of any individual, or small number of individuals, to erect and maintain; because the profit could never repay the expense to any individual or small number of individuals, though it may frequently do much more than repay it to a great society. (M. Friedman, 1980, 20; Smith, 1776)

The newly constructed expressway and university clearly had a hand in displacing the owners of land in the old Maxwell Street Market. But these were legitimate public works which have benefitted millions of citizens. They also left the Maxwell Street Market in a trash heap.

The way to "save" the Market is to return the Marketeers to land upon which someone has a vested interest in maintaining. Left to itself after the public works were developed, the "free marketeers" also became "free riders."

Despite planning's bad name in free market circles, a legitimate--from the Adam Smith standpoint--function for local planning would have been to return that land to private hands as quickly as possible. This was not done. The lesson of the Maxwell Street Market is that once government intervenes for legitimate reasons, in this case the expressway and the university, it

had better return as much of the area as possible to the local market. The planning department is the traditional agency within municipal government which expedites such tasks. It is thus possible to argue, even on Adam Smith grounds, for the legitimacy of local planning.

Prophets of deregulation forget that, to paraphrase Madison, that it is because men are not angels that they submit themselves to government. Government by its very nature regulates. The search for how little government to have leads to the frontiers of deregulation being pushed outwards into national areas like airlines and finance--two industries which have experienced tremendous displacement, the latter at cataclysmic public cost due to the confused "signals" (deregulation *and* increased guarantees (Mayer, 1990)) given from government.

The place to begin the free market experiments is where the free market begins--on the local level. The search for answers to the question--what local "planning" actions are legitimate and what are not?--should be at the local level as well.

### 6.7.3 Refuting the Commonsense Propositions of Rational Expectations

The task ahead will be to derive clues for the refutation of rational expectations commonsense propositions. These will be derived after considering the observation/history section and the models/analysis sections. Some preliminary questions:

1. Observation: To change or not change the model?
2. Analysis: are the methods of Rational Expectations the proper methods for ruling rational expectations in or out in policy analysis?
3. Action: how does one bound rational expectations?

Since the first commonsense proposition of RE is that actors guess right, any method which would prove that policy actors or economic actors or mostly wrong would do. An industry in which many investors perennially lose their shirts would be a poor candidate for



rational expectations. So would an industry undergoing a crisis, such as the savings and loan industry. We ask, did the market guess right, or did the government fool them?

If we turn back to the origins of Rational Expectations in the original John Muth-Herbert Simon collaboration, it might appear that rational expectations works in a market situation with little volatility or with a market with a lot of volatility biased to a certain known direction (Sheffrin, 1983, 141-143).

One other way of falsifying RE common sense is by proving that there is a chaotic market, and that everyone is holding their cards. RE in this situation becomes self-fulfilling, self-displacing prophecy. Perhaps it is not accidental that RE theory achieved its popularity during a period of high inflation, the latter 1970's.

In our quantitative analysis below, the testing for chaos and the testing of RE assumptions will work closely together.

#### 6.7.4 Refuting Akratic Common Sense

I've already noted the most famous refutation of akratic common sense, in which Kenneth Arrow demonstrated the logic behind the apparent illogic of group choices. Arrow moved group decisions out of the Akrasia box and closer to the Rational Expectations box by his demonstration.

The question arises for given cases, however, do we have the scientific resources at our disposal to use Arrow's insight effectively for prediction, as opposed to hindsight? If the answer is no, then it sometimes makes sense to treat what looks like public illogic, whose public logic is unknown, as illogic, when we are considering questions of policy or of action.

The akratic commonsense proposition--that "good" actions can have "bad" unintended consequences--cautions against assuming reasonable behavior. Reasonable behavior must be proven, or unreasonable behavior must be disproved. Another housing illustration, this time from the marketing of homes, might lead us to further insight.

#### 6.7.4.1 Emotions, Sales, and Market Rationality

If buying were a process entirely governed by rational decision-making, then *Star Trek's* Mr. Spock would be the world's greatest used real estate sales agent. But somehow, there's more to consumption than maximizing one's utility.

Is the choice to purchase one home, instead of the one identical to it nearby, a solely rational choice? Is this decision meaningless, since these items have identical price and features, and does here the rational choice story end? When economic prices are identical, and actors then make decisions based upon taste, and are these decisions still considered rational?

If the answer is yes, then try the extension of the argument into the political arena. If I am convinced that both candidates who want to be my Congressman are, as we say in Chicago, political hacks, do I flip a coin to choose for whom to vote? And if I do, is that decision rational?

Or does rationality require me to do more, to search for further information upon which to base my decision? If my Congressman got his son-in-law appointed to the Federal Home Loan Bank Board, I then execute the rational decision rule, "Choose that candidate for Congressman who does not have sons in law."

Piano manufacturers long ago discovered that a mediocre piano in a fine cabinet would sell marvelously, especially since skilled cabinet makers were in greater supply than skilled piano technicians. When a buyer's eyes overcame their ears, and they lived to regret the purchase of their piano, they might have termed their own purchase, "irrational." The rational economic theorist might argue that the look of the piano at the time of sale had a greater value than its sound, and the decision was rational on that basis.

#### 6.7.4.2 The "Circuit of the Senses" as an Aid to Rational Buying.

Commonsense advice to piano buyers--and especially to home buyers--might be, travel through a "circuit of the senses"--evaluating the product with one's ears, eyes, touch, etc., before one buys. This commonsense approach applies two definitions of common sense, one the *κοινη αισθησις* of Aristotle, the "common apperception", and sound judgment.

"Buyer regret," very common in the sale of homes, is studied by sales professionals, psychologists, and attorneys, especially because, it is theorized, the size and finality of the purchase lead to emotional soul-searching, contractual wrangling, and increased service calls. State laws recognize this, and most allow the cancellation of such a contract within a prescribed time. "Honey, how did we get talked into buying this house? We can't afford this!"

That there is a recognized value to the irrational, in the sense of emotional, dimension to sales is reflected in the monetary rewards given effective sales agents and to the amounts of money spent on training these agents. Real estate sales people, among many other sales professionals, spend money and long hours studying and honing their skills of emotional manipulation, of overcoming objections to sales, of learning how to push the "emotional buttons" of customers. Salespeople are taught to discern where to "close" a sale--in major sales like homes the salesperson must ask directly for the customer to buy the product--the bedroom suite with whirlpool bath for young couples, the family room with fireplace for the childrearing family, for example. On more than one occasion I have seen an experienced salesperson take a couple who have walked out of the house, engage them in conversation at their car, march them back in, and succeed in selling it to them minutes after a less experienced salesperson has bid them good-bye and apologized for not having they home they wanted.

These sales techniques do work, provided that economic conditions allow a given family to purchase, and perhaps overspend, for a given home.

The social scientist will reflect upon this anecdote and imagine a probability distribution throughout the sales forces in America of skilled salespeople, and argue that, on the macro level, buyers are maximizing their utility since there are not enough crackerjack salespeople who can talk people into making other choices than they intended. As salespeople get more trained, it can be argued, buyers get smarter, similar to the growth in abilities of pitchers and hitters in baseball, which have bunched the curves of batting and earned-run averages closer to the mean, as outlined by Stephen J. Gould on a recent NOVA program.

The real estate business owner will say, however, of the anecdote, "Who is that gal (guy), how can I get in touch with her (him) to hire her (him)?"

Granting that macro markets are substantially rational, it is thus still possible to demonstrate anecdotally that some local markets, indeed, are not. The existence of local regulation--especially as it pertains to fair housing and NIMBY ("Not in my back yard") issues--can be used as an indicator of that.

And the evidence for local irrationality in markets is not just anecdotal, it is empirical. Bruno S. Frey and Reiner Eichenberger (1991) reviewed the literature of anomalies in political economy, which they maintain are not fully eliminated in the aggregation process in some cases. Tversky and Kahneman have independently and in collaboration authored a number of studies which demonstrate that economic actors will make different and inconsistent choices between two identical economic alternatives presented to these actors differently (Kahneman and Tversky, 1979; Tversky and Kahneman, 1987; Quattrone and Tversky, 1988).

It is possible to extrapolate, through a Socratic dialogue, the iron clad rationality within the above real estate sales anecdote, and I acknowledge it is "there" myself. But I don't

believe that the information gleaned from such a translation is the most useful form for policy activity. The counterintuitive formulation of pure rationality is sometimes too cumbersome for day to day affairs. The dialogues of the university serve many purposes--local "identity maintenance" being an important consideration--other than direct economic production or consumption. It is not "rational" for economic actors to use them in their day to day affairs, in the sense that simpler words and less effort will sometimes suffice.

I propose rationality as a necessary but not sufficient condition for policy activity. Something else is needed, and sometimes it is persuasion, sometimes it is leadership.

The commonsense "local knowledge" refutation for the rational homebuyer is a good salesperson, who knows that without a skilled approach--at the minimum, "asking" for the sale--even an optimal sale will not be made. Likewise, the skilled real estate salesperson can sell someone the less than optimal choice. The other refutation is distraction, "I was going to do the right thing but I got caught up with kids or with TV." This is reminiscent of Augustine's use of the word *obstreperit* in the *City of God*. Demons "roar in your ears" and distract you. The difference between a sale or no sale, from the point of view of a skilled salesperson, is sometimes whether or not dad got up at halftime to run out the mini-mart, happened to see a home-for-sale sign, and walked into the waiting snares of the skilled salesperson.

#### 6.7.4.3 The "Mae West" Decision Rule

A common akratic mistake is to follow the "Mae West" decision rule, which I must admit I looked up and read on a T-shirt while a awakening from a nap on the bus. The decision rule is, "Of two evils, choose the one you haven't tried yet."

This rule seems to be followed by committees deadlocked and unable to reach a compromise: "Well, I suppose we *haven't* tried investing pension funds in our local S and L before. Perhaps we should give it a try." To displease no faction, a less than optimal choice is made which no one wanted.

#### 6.7.4.4 Buchanan's Commonsense Budget Proposal

I mentioned earlier the interesting fact that not one of the many noted thinkers taking part in the 1985 Rationality Conference at the University of Chicago (Hogarth and Reder, 1986; 1987) cited James Buchanan. At the time, prior to his Nobel Prize, he was regarded by some as a Chicago School heretic. Proposing that rationality was bounded, as did Herbert Simon, was one thing. But for Buchanan to propose constitutional limits on government spending--bounding government--was quite another. Earlier, we cited his words that his positions lay closer to "the common sense of ordinary citizens" (Buchanan, 1989, 1).

By this statement Buchanan acknowledged a commonsense proposition within his own theoretical work, that political actors can become "rent seekers" (Buchanan, et. al., 1980) or "entrepreneurs" (Wagner, [1980] 1984), which is a nice way of saying, to one degree or another, that they go into business for themselves. This force is strong enough to merit Buchanan's proposed constitutional remedy--a required balanced budget.

#### 6.7.4.5 An "Akratic Cap"

Buchanan's recommendation for a constitutionally balanced budget is an exercise in what I call "minimizing akrasia," or imposing an "akratic cap." Such a response is a legitimate public reaction to a problem which seems to have no solution but to place an institutional boundary on it, or to wait for international markets to react to United States deficits by devaluing American capital and place further institutional constraints upon American capital. The commonsense argument that proponents of an akratic cap make against those with a free market solution for the problem can be likened to the choice over whether to fix a leaky water pipe before or after it bursts and devalues the entire house.

With the discoveries of Arrow and others on the irrational summation of individual choices came something of an "unintended consequence" of a commonsense blessing to the

notion that all straightforward attempts to address public problems would sum to irrational public choices. What looked bad became good, what looked down became up, and what looked intolerable became tolerable. But understanding public irrationality as a rational process is still a far cry from controlling irrational public consequences. We can rationally explain the Savings and Loan mess, but we must remember that our real task is to clean up and avoid another such mess. If in the end, if one half of a trillion dollars have slipped by, it becomes obvious that commonsense thinking about what appears to be akrasia must change as well.

#### 6.7.4.6 Refuting Akrasia Wrap-Up

The challenge to economic science has been to recast the assumptions of akrasia into market rationality. The challenge to the public problem solving arts has been to be prepared for commonsense akratic results. A "word to the wise" about akrasia in public life might be: assume that what looks like akrasia *is* akrasia, and act accordingly until scientifically proved otherwise.

#### 6.7.5 Refuting the Commonsense Propositions of Chaos

##### 6.7.5.1 Refuting Mathematical Chaos

Earlier, it was noted that Cartwright assumed a pervasiveness for mathematical chaos which he did not prove. It is one thing to say that there is mathematical chaos in public systems, it is quite another to say just where that mathematical chaos is. You cannot safely assume, as a commonsense proposition of chaos asserts, that "nothing works."

Once you've found mathematical chaos, in some sense you have begun the process of translating your knowledge from the Chaos box to the Rational Expectations box. As and if science masters chaos modeling, foresight might be enhanced. The question of housing policy and chaos will be addressed in Chapter 8.

#### 6.7.5.2 Refuting Commonsense Chaos

It is very difficult to prove to public actors convinced that "nothing works" that indeed, "something does." Cartwright gave us a clue with his suggestion to use an "ensemble of forecasts." This amounts to an attempt to maximize the number of the "three certainties" which can be called upon to make decisions in the context of commonsense chaos. Public response to commonsense chaos is institutional and incremental. Again, this topic will be taken up more specifically in terms of housing policy in Chapter 8.

#### 6.8 The Need for "Generic" Formalized Common Sense

Policy analysis and political propaganda can be composed of the same building blocks--commonsense propositions--and these lend themselves easily to partisan usage and ultimately to confusion of fact.

Before a new, effective housing policy can be enacted, it becomes necessary to explore the partisan confusion of fact in the history of housing policy itself, in the hopes of building a "generic" store of "facts" of housing policy.

To explore the confusion of fact in housing policy, it makes sense to identify the contending "stories," composed of commonsense propositions, running through housing policy history. This approach tends to begin, as did Buchanan's (1989, 1), with the knowledge of the citizen and secondarily the knowledge of the legislator, executive, or specialist.

This knowledge is lost if partisan bloodletting destroys institutional memory or casts walls of silence over parts of the story.

#### 6.9 When to Leave Common Sense Alone

Common sense, especially of the local *sensus communis* variety, can rarely be generalized to universal public policies. The local nature of commonsense knowledge, of "what works here," limits the universality of local common sense. Formalizing local common



sense assists us in knowing what is possible in our little corner of the world. But there is no guarantee that this local common sense, or the formalization of it, will work elsewhere. In essence, my map of my neighborhood is not your map of yours. What makes sense, however, is for you to make your map, and for me to use it when I visit you.

Martin Mayer (1990) has documented how some local owners of savings and loans got caught up in very speculative investments in New York financial markets, while others did not. The speculators were "sold" a rosy, "no-lose" picture of the New York market. These speculators lacked "common sense" knowledge, in this case, local knowledge, of what could go wrong in New York financial markets. Had they tapped the accumulated local wisdom of New York financial skeptics, they might have been protected from making disastrous mistakes.

Local S and L speculators substituted the *demonstrative* certainty of the New York salesmen for their own *perceptual-moral* certainty, "what works here." They did not consult the *perceptual-moral* certainty, the "what works here" of the New York investment banker.

So one bit of advice becomes, "follow your own common sense until you're sure that someone else's is better." And beware what varieties of common sense, and the depth of their wisdom accumulated, you are consulting. "Look before you leap."

#### 6.9.1 Wrap-Up

In order to convince others of a policy question, we must often refute their common sense.

Refutation involves changing and sometimes negating a perception of certainty. Refutation of common sense in public policy involves changing a complex sense of certainty about a question of policy that has been constructed into stories comprised of commonsense propositions. This chapter attempted to catalog a number of these commonsense propositions and approaches for their refutation. This was only a beginning.

The rest of this work will attempt to put into practice what I have proposed heretofore. It is an experiment in reasoning through a public problem, specifically the Mortgage Interest Deduction, and testing what my proposed method of formalized and accumulated common sense can offer.

To enact this experiment I will construct a complex sense of certainty about housing policy first and about the Mortgage Interest Deduction in particular second. Scientific inquiry will be situated within the context of the complex sense of certainty called common sense.

The plan of this inquiry is to step into the "jumble" of everyday thought and logical reflection that coexist in the contending stories of housing policy. It is not possible within a short time to tell or refute all the "stories" of housing policy, but it is possible to draw from these stories a "story about the stories." This "story about the stories" is the beginning of formalized common sense about housing policy. Housing policy may still be a "jumble" after this gambit, but it will be a "jumble" we can step into, find out things we need to know to solve problems, and then step out of.

## Chapter 7

### HOUSING POLICY

#### 7.1 The Complexity of Housing Policy

The last sixty five years have seen a progression from no federal housing policy to a tangled Gordian knot of housing, taxation, labor, trade, banking, civil rights, environmental, transportation, and other legislation and case law which makes the housing industry, along with the lending industry, probably the most regulated business in America. Much legislation which affects housing is not even classified housing legislation.

When a builder or owner wants to sell a home, the newspaper ad must conform to state real estate laws concerning notification of brokerage involvement, to federal banking Regulation Z if interest rates are mentioned, to federal civil rights legislation in the exclusion of sex, race, ethnic, or religious references in ads, to case law in the use of multi-racial hired models in pictures of prospective homeowners, provide precise definitions of energy saving features according to federal environmental regulations if energy savings is a topic in the ad, and notify the buyer of any defects and dangerous substances. Federal and local settlement procedures acts determine the structure of the sale closing and exchange of ownership for valuable consideration. Forms must be filled out for federal, state, and local tax purposes.

TABLE XI  
MAJOR PARTICIPANTS AND INFLUENCES IN THE HOUSING MARKET

MARKET PHASE	PARTICIPANTS	INFLUENCES
Preparation: land acquisition, planning, and zoning amendments	Developer Landowner Lawyers Real estate brokers Title companies Architects and Engineers Engineers Surveyor Planners and Consultants Zoning & Planning Officials	Real Estate Law Recording regulations & fees Banking Laws Zoning Subdivision regulations Private deed restrictions Public master plans
Production: site preparation, construction, and financing	Developer Lending institutions (interim and permanent) FHA, VA, or private mortgage insurance company Contractors Subcontractors Craftsmen and their unions Material manufacturers and distributors Building code officials Insurance companies Architects and engineers	Banking laws Building & Mechanical Codes Subdivision regulations Utility regulations Union rules Rules of trade and professional associations Insurance laws Laws controlling transportation of materials
Distribution: sale (and subsequent resale or refinancing)	Developer Real estate brokers Lawyers Lending institutions Title companies FHA, VA, or private mortgage insurance company	Recording regulations and Real estate law Transfer taxes Banking laws Rules of professional associations
Service: maintenance and management, repairs and improvements and additions	Owner Maintenance firms and employees Property management firms Insurance companies Utility companies Tax assessors Repairmen, craftsmen, and their unions Lending institutions Architects and engineers Contractors Subcontractors Material manufacturers and distributors Local zoning officials Local building officials	Property taxes Income taxes Housing and health codes Insurance laws Utility regulations Banking laws Union rules Rules of trade and professional associations Zoning Building and mechanical codes Laws controlling transportation of materials

(President's Committee on Decent Housing, 1969, 115)

In order to build a home on a new subdivision, developers must in many cases provide environmental or economic impact statements, hire a federally approved wetlands consultant to determine whether a federally designated wetland is involved (the Army Corps of Engineers reserves the right to designate areas as wetland even if they are not so designated on official maps), pay local impact, development, or infrastructure fees, appear before local planning, zoning, and municipal boards, conduct community meetings with neighbors of a project, conform to federal and local Davis-Bacon wage guidelines if federal moneys are used beyond preliminary phases, conform to the federal Interstate Land Sales Act of August 1, 1968 (Public Law 90-448) if lots exceed twenty-five in number even if no interstate sales are involved, provide local building and zoning officials with detailed plans and engineering studies which are sent back for multiple revisions while subsequently being prepared to make on-the-job changes at the request of local officials when neighbors request spot changes despite prior approval of plans by building and zoning departments, grant easements for public use and in some cases provide public amenities such as roads, water lines, and sewers, conform to federal clean water standards even when these are contradicted by local ordinances to the chagrin of locals, maintain proper OSHA required records and standards, make sure subcontractors conform to federal Hazard Communication Standards and inform workers of dangerous building materials, and, leaving out a good chunk of the list, continue being liable, in some states unto the third homeowner and beyond, for many aspects of the building due to case law on implied warranties of habitability, merchantability, and fitness for use. The latter implied warranties and the complications of homebuilding, when combined with the time and capital necessary to procure and develop land, have in recent years increased the role of professional land developer as distinct from builder. Similar sketches of market and regulatory interaction could be drawn of the lending, brokerage, insurance, and legal sectors of the housing market.

The above-mentioned regulated activities are clearly advances from the days when my grandfather, excavating with a horse and "scoop", built homes before local building permits and zoning legislation existed. But the days of expecting predictable effects from straightforward housing policies are long gone. Good sounding policies can be disastrous when government agencies have become "mature" bureaucracies, nested in a tangle of contradictory law and regulation in which the agency consequently has a choice of movement and therefore institutional autonomy.

In his final years, the late New Dealer Rexford Tugwell (1970) called for a fourth branch of government to accomplish planning tasks. While not quite what Tugwell envisioned, mature autonomous bureaucracies have in a sense established this branch without clear and coherent missions or results.

By regulating the housing industry to such a degree, government has also succeeded in fostering a relatively sophisticated and organized industry in a comparatively efficient market--a market, however, still subject to booms and busts, and teetering upon a lending and insurance industry threatening itself to collapse.

The sophisticated developer or builder has the benefit of institutional economists working for the NAR, the NAHB (National Association of Homebuilders), the MBA (Mortgage Bankers Association), the US League of Savings Institutions, and numerous trade journals. The unsophisticated "seat of the pants" small builder or rehabber must still interact with lenders and appraisers who have access, to a degree, to current economic information. If there is a profitable loophole in a federal program concerning housing, it will be discovered pronto, and millions, if not billions, will be lost to the federal treasury before the federal barn door closes.

The "seat of the pants" builder traditionally has guessed at unemployment and interest rates to help make the decision to build multi-unit or single-family housing, respectively, and

has increased production as these rates have fallen. Figure 7 and Figure 8 illustrate the logic of the "seat of the pants" tradition, and its declining reliability in the case of multi-unit starts. The difficulties both of those playing the housing market and those shopping in it have increased calls for intervention by the government, especially in the case of rental housing (Downs, 1983).

George J. Stigler's (1971) "capture" theory of regulation, in which regulated firms attempt to capture regulators to the extent they can, also drew attention to the demand regulated firms exert for more regulation which benefits them. As shall be seen, the mentioned industry organizations played an overwhelming role in the founding and staffing of government agencies which regulated housing and housing finance.

Developing effective models of such highly regulated and subsidized industries is extremely difficult. The Rational Expectations (RE) Policy Critique of Lucas ([1976] 1981) asserted that static econometric methods do not take into account that actors will anticipate government action and adjust their behaviors to what they guess will be the effects of government action. When government acts, it is not just changing the magnitude of one or more variables in an econometric model, it is in a sense changing the model.

It is interesting to note, whether one dips into the regional science or the urban economics literature, that the topic of rational expectations comes up when unanswered questions remain after diligent research effort. Anas (1988) concluded at the end of an ambitious five-year modeling effort of the Swedish housing economy that he still had to examine rational expectations as a possibility. Yinger (1988) also cited rational expectations as a possible explanation of the behavior of home buyers in Massachusetts. I will herein propose that formalized common sense demands that rational expectations, among other commonsense challenges to scientific argument to be hereafter introduced, be ruled in or ruled out of each major model of housing markets intended for planning and public policy decisions.

Figure 7. Seat of the Pants Builder, Apartment Starts, 1970-1983.

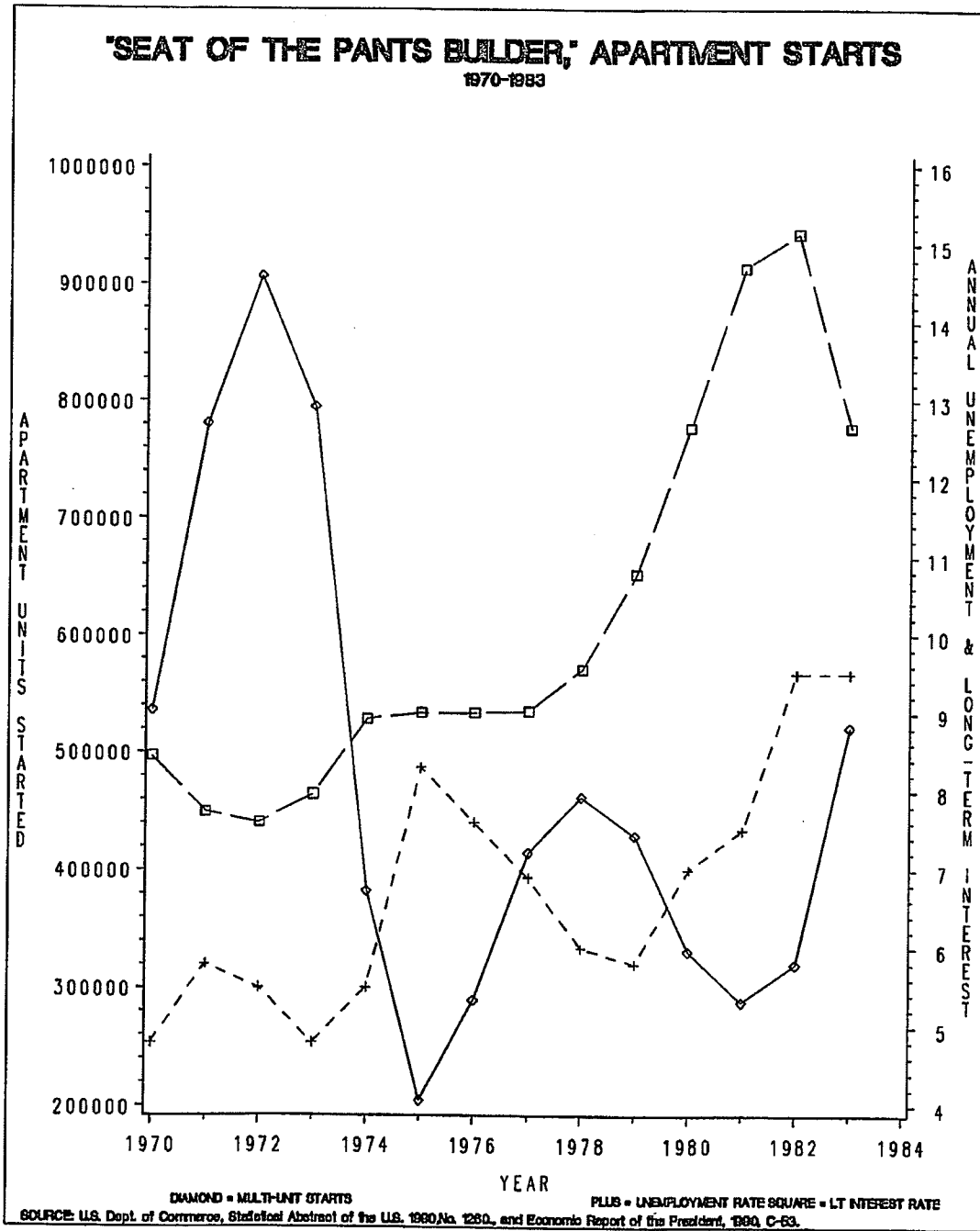
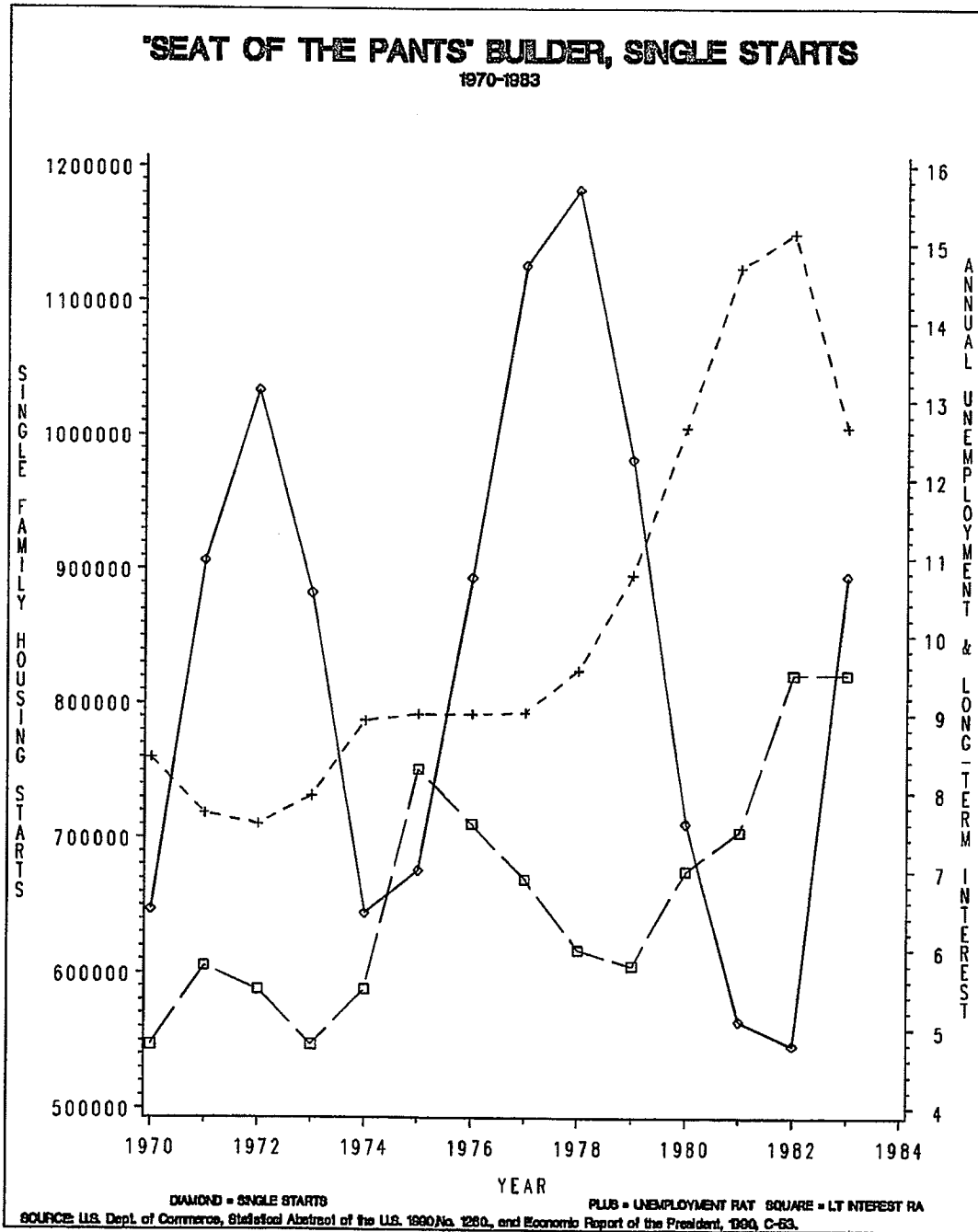




Figure 8. Seat of the Pants Builder, Single Starts, 1970-1983.



## 7.2 Moral Mythology and Housing Policy

Underlying examinations of housing policy are themes of moral certainty which interpose themselves in housing policy analysis. Here are two essential ones.

### 7.2.1 The Myth of Self Determination.

Hard-working Americans, through the sweat of their own brows, gain for themselves home ownership. Communities, through unceasing organizing and effort, succeed, in the name of self-determination, in attracting funds from someone else for new home development. Never mind that either feat is guaranteed by the federal government to the tune of \$1 trillion in contingent liabilities and many other billions in tax breaks for either single family or low-income home development. Like that mythological politician who was born in a log cabin which he built with his own hands, housing policy must make housing possible without taking from Americans their initiative or their self-image as self-providers.

Carrying the myth one step further, you could argue that the wealth underlying the money lent to American home owners was created by the American home owning workers themselves, and taxed or drawn away from them. There are thus contending stories about the myth of the self-reliant home owner.

### 7.2.2 Real Estate as the Answer to Dr. Freud.

When a policy, no matter how poorly thought through or analyzed, corresponds with such a universal and basic human need that it is unthinkable that government should not enact such a policy, it is continually enacted, whether effectively or no. Such might be the situation with housing policy. Many religious and community leaders speak of a "right" to housing.

Besides a universal need for housing, it is hard not to admit that there is something more than a need for housing at work. There is such a passion about housing that it is surprising that Dr. Freud did not put it right up there with love and death.

Had Dr. Freud ever witnessed a NIMBY hearing on drainage, zoning variances, or toxic waste, psychoanalysis would have taken a decidedly more social turn. Today, hundreds of thousands of real estate salespeople hustle to answer Dr. Freud's unanswered question, "What do women want?" These brokers and agents find that both women and men want better and beautiful housing, too.

And if Dr. Freud needed any more proof that the drive for housing exceeds the drive for eros in social and economic importance, he need only compare the 1987 circulation of *Better Homes and Gardens* (8,012,659) and *Good Housekeeping* (5,202,526) versus *Playboy* (3,732,948) and *Penthouse* (2,251,491). If one has a problem with one's sex life, the Chicago Yellow Pages has almost seven pages of psychologists, psychiatrists, psychoanalysts, or social workers who can be consulted. But if one has a real estate question, one can sift through twenty-eight pages of real estate brokers in order to get help, which, while not as highly trained, is considerably more highly paid by the transaction. Notice we haven't even gotten to the lawyers at this point.

While you can argue that the home is the shelter for conjugal love, the cash flow generated by housing and construction arguably dwarfs the cash flow generated by every vice sold on the face of the earth, with the exception of armaments. It seems Dr. Freud was right about death. Even so, try to name a war besides the Homeric Trojan War over anything not involving real estate. The Judgment of Paris notwithstanding, many more thousands of ships have been launched in anger over land than over the lovely faces of diverse Helens.

Moses, in his patriarchal wisdom, listed the commandment against coveting thy neighbor's house before coveting thy neighbor's wife (Exodus 20:17), and only the later version in Deuteronomy (5:21) reversed the order of house and wife. Patriarchs have been confused on this coveting matter ever since, both in personal and in public policy.

### 7.3 Ideology and Story in Housing Policy

Housing policy, perhaps to a degree greater than other policy debates, remains buffeted by an ideological storm which keeps even basic facts of housing under dispute. The size of the homeless population, the affordability and quality of housing, the usefulness of vouchers, the proper object of federal spending for housing, the discriminatory or beneficial effects of local zoning regulations, whether welfare and housing aid should be integrated--all these issues are debated by political camps whose common ground is merely their common battlefield.

Upon this common battlefield a number of larger ideological armies fight, using propaganda comprised of conflicting commonsense arguments. One major army defends the legacy of the New Deal and the Great Society. Another attacks, inferring that the progressive programs of those eras wasted resources and encouraged failure of individual effort and enterprise, key to the growth of personal wealth as reflected in the growth of housing. A "radical" tradition, drawing from Marxist ideas, views both of the previous positions as mirror images of a contradictory and doomed capitalism, both alienated by an opiate myth of home ownership. While this latter tradition has taken a beating of late politically with the fall of Leninist states, it survives as an intellectual tradition capable of insight and with a powerful persuasive sentiment.

"Behind the lines" of this common battleground are told contending "stories" about housing policy, among which are:

- Central (state, federal) versus local (municipal) control of housing funds and a cycle of government abandonment as "the cracks" (those into which things fall) widen between contending government interests during said cycle.
- The steady, incremental liberalization since 1932 of federal housing terms--loans, interest rates, down payments, qualification schedules, loan to value ratios, insurance coverage,

etc., along with the growth of secondary market mechanisms necessary to guarantee the expanding debt--FNMA, GNMA, etc., thus accelerating the effects of financial markets on housing.

- Nominally expanded services for nominally less money, both in the gradual reduction of visible up front fees from housing recipients and in monies appropriated for actual implementation, resulting in the housing policy "lottery" (Sternlieb and Listokin, 1987, 36) in which a fraction of those eligible for aid receive it.
- The tug of war between focused and systemic solutions: ad hoc programs are created, then recentralized into bureaucratic apparatus in "memory" form near the end of their precipitating crisis.
- Focusing a federal housing program is difficult because its implementation is subject to interplay of, among many others, legislative agendas, agency regulation, local governments, and financial markets, which each "squeeze the balloon" into something not resembling the symmetry originally intended.
- The recurring effort to keep federal construction monies focused primarily on housing as opposed to institutional, commercial, and industrial concerns.
- "Trust the market" vs. "trust the people": rent control, while representing a tiny portion of the monies allocated for housing, nevertheless grabs headlines away from other housing debates affecting larger numbers of those in need of housing.
- The tug of war between low-income housing and "low-to-moderate" (read moderate) income housing as the recipient of funds.
- Private market and government markets: how fortunes were made with the help of federal dollars, and how market interests shaped federal programs.
- The rise and fall and rise of cooperatives and of manufactured housing.

- The enduring "color line."
- Policies by accident versus policies by design.
- Bureaucracy gains functional independence amid legislative confusion.
- How recipients and providers of public housing are forced to subsidize themselves, and they sometimes can't. How these self-subsidizers thus pay an indirect tax to maintain policy rhetoric, and how this process is spreading throughout other areas of housing policy.
- The search for a hybrid form of tenure which is neither owner nor renter but which has all the benefits (but subsequently many disadvantages) of both.

These and other stories recur throughout the housing policy narrative, and entangle political melodrama with housing policy action. Any housing policy initiative confronts some of the most powerful popular mythology in American culture. In order to "sell" a policy change in housing, it is necessary to "sell" it within the accepted popular iconography, or, more daunting, to change the housing iconography.

Returning to martial metaphor for ideology, it is possible to speak of "the fog of policy" when considering the tangle of Federal programs legislated for housing. Kevin Kramer's (1985, 79-87) dissertation took a table almost nine pages long to count 117 housing programs embedded and overlapping throughout the federal government administered by seven cabinet departments, by the then Veterans Administration, and by nine other commissions, agencies, departments, and authorities. For each of the 117 programs contained in Kramer's 1979 snapshot of the housing policy fog there is a tale of executives, of legislators, and of constituencies.

### 7.3.1 An Economy of Housing Policy Research

How to properly understand this mess, and then to proceed to change it? Again, Peirce provides a clue in his idea of "economy of research." What if we considered housing policy, not so much in terms of where the policy debates lie, but in terms of where the most public money is promised and spent? In doing so, we first must look at the over \$1 trillion in federal contingent liabilities for housing as already depicted by Figure 3 in Chapter 1. Then, in looking at federal indirect subsidies for housing, our attention turns to the "homeowner preferences" illustrated by Figure 1 in Chapter 1. Only then do we consider programs of direct housing assistance, which comprise a relatively small proportion of federal commitments--contingent, indirect, and direct spending--for housing.

At first, this might seem less "humane" than spending our efforts considering the complaints of those for whom the tiniest proportion of housing assistance is committed. But looking at where most of the money is promised or has gone, and understanding that process--communicating as we do so how it might change--might ultimately provide more assistance for those needing it.

At the end of a House Banking Committee hearing on August 9, 1990, and broadcast two days later on C-SPAN, Committee Chairman Rep. Henry Gonzales, Democrat of Texas, mused that tax policy really makes banking and housing policy, and that his committee is at the mercy of larger policy forces and is limited in their larger effect upon banking and housing. These larger forces we seek to understand. The bank robber Willie Sutton's famous answer to the question, Why he robbed banks--Because that's where the money is--is echoed in my answer to the question, Why do I study housing policy from the point of view of where most of the federal money is devoted--Because that's where the policy is. Hundreds more pages of federal housing legislation and regulation will not change housing policy unless we understand that the policy is really where we spend, and promise to spend, the most money.

### 7.3.2 What We Just Did

The preceding discussion moved "toward" commonsense housing policy positions: the pro-New Deal, the anti-New Deal, and the radical. It then moved "away" from them, by constructing a catalog of contending policy "stories." It then moved "against" these commonsense positions by suggesting another way of ordering the discussion, along the lines of "economy of research." This process of inquiry will be used right now to look more specifically at some of the bits of "received wisdom" about housing policy, to "move away" from this "received wisdom," and to set the stage for "moving against," in this case, for quantitative examination of proposals about the MID.

### 7.3.3 Retelling the Housing Policy Story

Because of symbiotic ties among housing and finance institutions and constituencies and government housing policy makers and agencies, and because policy history can shed light on these ties, a proposed housing policy involving a possible fundamental change in housing and taxation must be viewed in the context of the history of housing policy and finance, of housing markets, and of tax policy. This work can only touch major themes in this history.

This policy history narrative begins with the end of the colonial period and continues to the period "From New Era to New Deal," the period covered by William Barber's (1985) book of the same title. From this period will be extracted the key "story" themes which will provide a context for the particular issue of housing and taxation. Since for the purposes of this work a complete history of housing policy is not necessary, the period from the end of the New Deal to the present will be summarized in a recap of "variations on housing policy themes" which had their origins in the earlier period.



The "story" of the Mortgage Interest Deduction will then be placed into a wider context, which should give the reader a sense of what changes in the Mortgage Interest Deduction are feasible, and the stage will be set for the technical discussion of the next chapter.

#### 7.3.4 Housing and Finance Policy Before World War I

The history of housing policy in the United States can be told from the point of view of growing market intervention in what began as a nation of settlers and speculators and what became a honeycombed concentration of predominantly urban and suburban homeowners served by redundant, complementary, and conflicting federal, state, and local agencies. The standard treatment of federal housing policy begins with the 1930's. Since the housing finance industry was established and nationally organized as a trade in an earlier period in which it had already affected national policy, stepping fully clothed into the federal regulatory apparatus in the 1930's, we "move away" from the standard chronology, and begin "moving away from common sense" with an earlier look at housing and housing finance.

##### 7.3.4.1 Federal Land, Local Governments.

As the dominant landowner and dispenser of land, the growing central government from the earliest days under the Articles of Confederation set the pattern for future development. America needed no reforming prince to open monastic lands for the commoner. The founders' will, made manifest in the Northwest Ordinance of 1785, superimposed the rational grid upon the wilderness, pushed the Native Americans aside, parsed frontier into range, section, and township, and allotted the sixteenth for a school taxing scheme--a scheme based upon the taxation of personal property that by the end of the Nineteenth Century had evolved into the taxation primarily of real property. No less that two thirds of today's privately held land once lay in government hands, sold by the 640 acre section until 1832, then by the 40 to 160 acre parcel, becoming the homestead of 1863, redeemed by five years of labor and building.

Transferred not by life estate or Old World dower, the predominant "estate" in land ownership was the unrestricted fee simple (what the Continent would term "allodial" title (McDonald, 1985, 12)), and title, to the degree that title in land ever can, passed quickly from one freeman to another (Pozdena, 1988, 4-5).

There were no shortage of shysters surrounding the land sales and claims. Subsequent federal reforms attempted to respond to the attendant outcry. News of the land sales was manipulated, and it was said that the wealthy amassed disproportionate holdings because of the cash terms of sales upon which the government relied for revenue until it became an industrial and, by 1913, an income-taxing giant. The federal government implicitly placed in the hands of subdividers and local land agents the shaping of cities and towns.

From the Colonial Period to the first World War, outside of the central government's purchase and sale of public lands, preferences given to railroad, the regulation of land transfers, the 1865 case of General Sherman's Civil War direct transfers in "Special Field Orders, No. 15" by "possessary" title of Union-seized land to 50,000 former slaves (McPherson, 1988, 841-842), the building of wartime barracks and of planning for cities like Washington D.C., local governments and markets, with the railroads playing a large part, took initiative in housing, such policy as it could be called.

City planning, while practiced by the federal government in L'Enfant's plan for Washington, D.C., was informally imitated but usually not legislated by thousands of communities, the wide boulevard and ubiquitous city lot of varying dimensions in the range of 25 by 125 feet being the silent legacy of William Penn, the surveyor's chain, and L'Enfant. A more cautionary Pierre Charles L'Enfant achievement was his firing by George Washington when he demolished the property of a prominent landowner (National Geographic Society, 1988, 97). L'Enfant's work was completed by Andrew Ellicott, fulfilling Holy Writ's prophecy about the planning profession, "One sows, another reaps."

#### 7.3.4.2 Local Urban Blight and Reform

As industries and immigration packed the cities throughout the Nineteenth Century, the choleric charted Eastern tenements and the later Chicago, Peshtigo, and Boston fires of the 1870's inspired New York's Tenement Laws of 1867 and 1879 respectively, reactions to discoveries on sanitation and fire. The crush of overworked immigrants into poorly plumbed and planned clumps of flat buildings and tall tenements moved reformers like Lawrence Veiller, Jacob Riis, and Richard W. Gilder to call for more public intervention, in response to the word of the age, "blight" (Chudacoff, 1981, 117-119). Although another New York law was added in 1901, such proposed public intervention was not to come until much later.

#### 7.3.4.3 Financial Industry Organizes

But prior to these early local laws housing financial institutions grew and organized into an industry. The first financial institution dedicated to home finance appears to have been Oxford Provident Building Association, organized in Pennsylvania on January, 3, 1831. Participants were shareholders, not depositors, and that and similar "building societies" bought land and built homes for their members. "When these institutions began making loans to people who planned to build houses on their own land, as well as financing the acquisition of existing homes, the associations came to be called building and loan societies" (Brumbaugh, 1988, 3). Such societies had spread to all the then existing states by 1890. "By the 1890's about 70 percent of residential (nonfarm) mortgage debt held by financial institutions was held by mutual savings banks and savings and loan associations" (Pozdena, 1988, 7). Over 50 percent of home loans, however, were held at the time by individuals or private, usually fraternal, organizations.

The home lending industry experienced a great and formative crisis in the 1890's, when many national thrifts failed. The U.S. League of Local Building and Loan Associations, now the

U.S. League of Savings Institutions, was founded in 1892, and subsequent U.S. League influenced legislation in many states drove the national thrifts out of business after the 1893 recession (Brumbaugh, 1988, 8). Not uncoincidental with the recession and the founding of the U.S. League, the U.S. Congress granted thrifts tax exemption in 1894 which was not rescinded until 1951 (Brumbaugh, 1988, 6,24).

Although reliable census information on housing dates from the 1850 census regarding "free" family and dwelling houses, and while the 1860 and 1870 censuses list both occupied and vacant dwellings (Hibbs, 1978, 25), the first general and somewhat reliable national housing and housing lending information was collected in the 1890 Census, and appeared in 1893. "Eighteen and one half percent of all housing units built in that year (1890) were in structures of three units or more. This figure reached 22 to 23 percent in the 1920's and 1930's" (Pozdena, 1988, 8). Financial institutions held the greater portion of mortgage loans for the first time in 1903. Only 27.7 percent of homes were mortgaged in 1890, rising to 39.8 percent in 1920 and perhaps to 45 percent by 1930 (Pozdena, 1988, 10). Pozdena estimated that the debt to value ratio at the time of home purchase increased to 50 percent by 1930.

#### 7.3.4.4 Local Control and Local Initiative

At the local level shortly after the turn of the century, zoning ordinances were enacted. While the received wisdom of the planning profession has the New York zoning ordinance of 1915 being the first, Marc Weiss (1987, 13) maintained that the first such ordinance for a major city was that of the City of Los Angeles in 1908, which was court-tested and reaffirmed legally for land-use zoning (1908-1915) and for single family zoning (1921-1925). Bicoastal primogeniture notwithstanding, these ordinances spread throughout the country and were in almost universal usage by the late 1920's.

During this period, private charitable housing initiatives began to take shape. Besides the company town of Pullman, Illinois built in 1880, the first subsidized housing in Chicago was forty-unit Francisco Terrace designed by Frank Lloyd Wright in 1895, and developed by Edward Waller as a limited dividend, 3 percent return project, unlike Pullman, a 6 per cent project (Bowly, 1978, 2). Similar limited-dividend projects were attempted in other major cities.

#### 7.3.4.5 Progressive Era Federal Housing Studies

As the United States shifted from rural to urban predominance, the federal government took a greater interest in common urban problems. One of the earliest recorded federal appropriations for a housing-related issue was a \$20,000 study commissioned in 1892 which investigated 4 cities of 200,000 or more (Pub. Res. 52-22, July 20, 1892).

In 1908, President Theodore Roosevelt appointed a Housing Commission to investigate slum conditions. Among the recommendations of the Commission were government condemnation of slum properties and their replacement or improvement, the resulting dwellings to be made available for rent or purchase to the poor at low interest rates, along with government loans for building (U.S. Congress, 1975, 1). These themes were to be heard throughout federal housing policy for generations.

#### 7.3.4.6 Summary of Pre-World War I Housing Production.

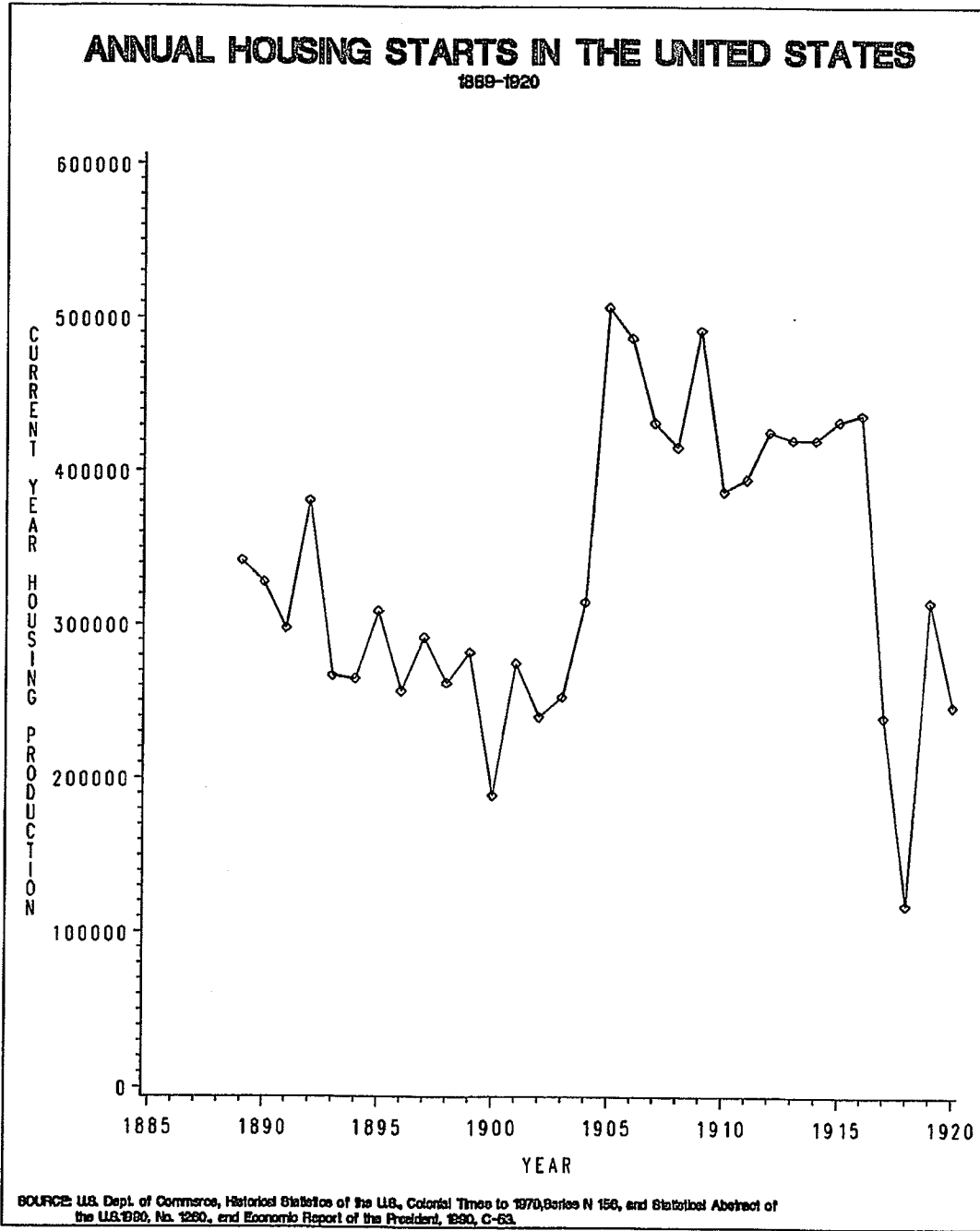
Figure 9 displays annual housing construction from 1889 to 1920 taken from U.S. Census (1976, 639-640) historical data.

### 7.3.5 Foundations of Housing Policy and the New Era, 1916-1933.

#### 7.3.5.1 Wartime Housing

It was not until the Tax Act of 1913 and its revenues that the federal government could even dream of producing or subsidizing housing on a national scale.

Figure 9. Annual Housing Construction in the United States, 1889-1920.



The wartime Shipping Act of 1916 established the Emergency Fleet Corporation of the U.S. Shipping Board (USSB) which subsequently was organized in 1917. In 1918 the USSB "was authorized to buy land, to make housing loans, to requisition housing, and also to build its own facilities for 'employees and families of employees of shipyards in which ships are being constructed for the United States (40 Stat. 438 1918)'" (Friedman, 1968, 95). The limited-dividend companies incorporated by shipbuilders to build such housing defaulted on their loans, the U.S government lost \$42 million, and Congress distributed the housing to other agencies in 1920 (Fisher, 1959, 76). This rather inauspicious episode is telling: no sooner does the federal government build but it chooses companies which default and is left holding the bag.

Established by Congress in 1918 (40 Stat. 550 1918), the U.S. Housing Corporation (USHC) of the U.S. Department of Labor provided housing units for war workers, according to Chudacoff (1981, 201) "the first direct federal program to provide low-cost housing." The USHC built units which housed about 6,000 families and 7,000 single persons. "Congress ordered all units sold in 1919" (Friedman, 1968, 96). Despite the urgings of reformers like Clarence Stein and Henry Wright, Congress ended the programs after the War.

#### 7.3.5.2 Attempts at Local Public Housing

Although the House Subcommittee on Housing and Community Development's 1975 chronology of legislative and executive actions on housing and community development (U.S. Congress, 1975) lists nothing from June of 1918 until December of 1931, much local, state, and federal government activity concerned housing during this period. Local governments saw some efforts in the public support of housing. Wisconsin law in 1919 allowed certain cities to finance limited-dividend cooperative-housing companies. New York City was authorized within a few years to grant tax exemptions to such limited dividend projects, although an attempt by

Stein and then Governor Alfred Smith to amend the state constitution to create a state housing authority failed (Chudacoff, 1981, 201).

#### 7.3.5.3 Roaring Twenties Housing Boom.

While public housing faltered, private housing flourished. The years 1919 to 1929 saw the first housing boom in U.S. history to approach annual production nearing one million units. Figure 10 displays annual housing construction totals from 1915 to 1935, taken from U.S. Census (1976, 639-640) data.

One hundred thousand bungalows were built in Chicago area during this 1919-1929 period, along with thousands of two and three story flat buildings, and higher rise luxury apartments (Chudacoff, 1981, 202). This era, in terms of the increase in luxury unit production near the peak of the cycle, bears similarities to our own late 1980's.

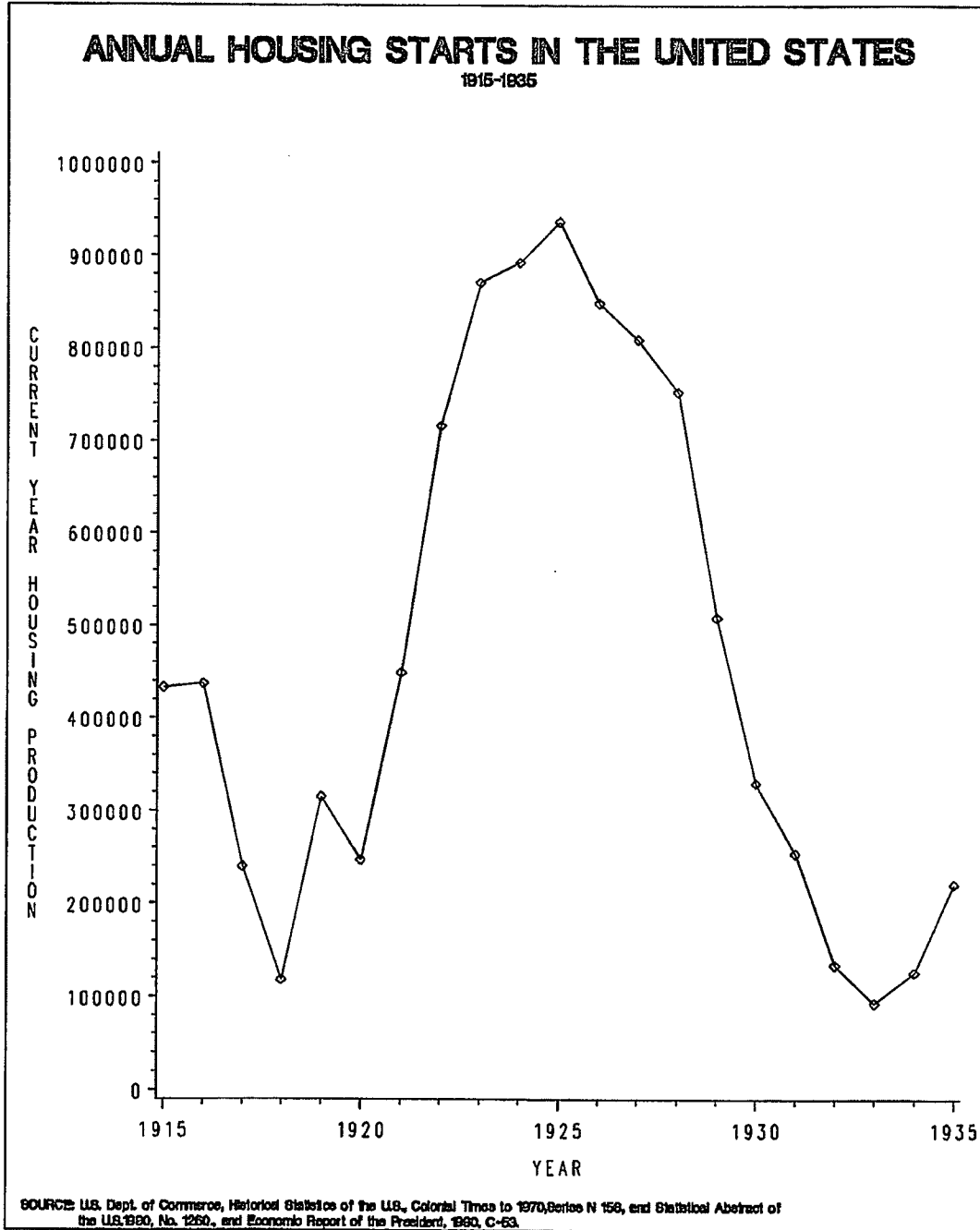
#### 7.3.5.4 Hoover Secretariat

The housing boom of the 1919-1920 period was not without government assistance. The Senate, concerned about a wartime housing shortage, conducted hearings in 1919-1920 (Hawley, 1981, 71). Herbert Hoover, Secretary of Commerce under Warren G. Harding, enlisted the help of Franklin T. Miller, who conducted the Senate inquiry, and pushed for and got a \$50,000 appropriation to found the Division of Building and Housing in the Bureau of Standards within the Commerce Department. To this post Hoover named Harvard Business School professor of the "Chair of Lumber" John M. Gries, who had served the government earlier in the Bureau of Corporations and during the First War in the Division of Planning and Statistics.

Hoover had a special interest in what he called "the housing problem." In a 1920 article and in subsequent correspondence Hoover stated that disorganization in the housing industry had left the nation with a shortage of a million homes, subjected the economy to building



Figure 10. Housing Construction in the United States, 1915-1935.



booms and slumps, and stood in the way of making America a "nation of homeowners." That celebrated phrase would echo many times in federal housing legislation and in political bombast (Hawley, 1981, 71; Weiss, 1987; Hoover, 1920).

Once John Gries was securely in charge of the Division of Building and Housing, he worked closely with the Chamber of Commerce and the National Federation of Construction Industries to implement Hoover's policies. Ellis W. Hawley, the Hoover scholar, divided the housing efforts of the Hoover Commerce department into four main areas:

1. Gries's work with trade and commerce organizations on "community action programs" on housing, some of which stalled over labor matters, while others did have some success on local levels in increasing construction.
2. Statistical dissemination from the Commerce Department to the housing industry along with encouraging waste elimination programs.
3. The organization of advisory committees to produce model building codes, improved zoning ordinances, and standardized contract specifications.
4. The Commerce Department studied the problems of home financing, the seasonality of construction, and construction planning. (Hawley, 1981, 55)

According to Hawley (1981, 47), Hoover

consistently sought a "middle way," a program of action that could draw on the energy and resources of private enterprise yet deploy these within the context of purposeful planning and coordination. Such had been the nature of his plans for European reconstruction and postwar trade revival. And subsequently, as he concerned himself with labor conflict, agricultural adjustment, and the performance of the coal, housing, and transportation industries, he consistently called for governmental agencies that would provide "illumination, guidance, and cooperation" rather than dictation or coercive controls. Clearly, he argued, there was a need for collective initiative, overall coordination, and national planning. Left to "haphazard development" and the workings of unrestrained competition, modern economies functioned badly. Yet when "politicized," they performed in even worse fashion. If their potential was ever to be fully realized, it could be done only through organizing cooperation in "the community as a whole," providing the cooperative groups with a "national conception" of what could and should be done, and

supplementing their efforts with informational aids and supportive governmental actions. (Hawley, 1981, 47)

In the fall of 1921, at the urging of Secretary Hoover, President Harding convened an Unemployment Conference, which was coordinated by Hoover's Commerce Department. The statistical programs for the construction industry were emphasized. A new Division of Simplified Practice was established under the William Durgin, and sought to standardize construction materials and practice. The Housing Division of Gries was given increased impetus to assist in the revision of building codes, cooperation in the construction industry, and the encouragement of home ownership. Early in 1922 Hoover called for a new national organization which would unite manufacturers, builders, and workers to create more business and employment. The resultant organization, founded in June of 1922, was the American Construction Council, directed by none other than Franklin D. Roosevelt (Hawley, 1981, 59).

After the death of Harding, Hoover remained as Commerce Secretary under President Calvin Coolidge, but never with the same coordinating power over administration initiatives. Although Hoover and his lieutenants confidently saw the effectiveness of their efforts in the housing boom of the mid 1920's, scholars have been divided on the subject.

#### 7.3.5.5 Hoover Presidency.

Although the New Deal brought federal housing policy into the modern era, it was the Hoover Administration which laid the groundwork for the reforms to come, however Hoover may have hampered them with his doomed fiscal 1933 budget.

Several Division of Building and Housing hands worked on Hoover's Conference on Home Building and Homeownership in December, 1931. The Conference was comprised of 400 specialists in 25 fact-finding and six auxiliary groups (Mason, 1982, 8). John Gries again played a pivotal role in this Conference, and edited the several book-length conference reports,

which addressed the gamut of housing issues, including a volume on "Negro housing" (Gries and Ford, 1932b).

Housing finance recommendations were among the most urgent of the Conference. Hoover's successor as Secretary of Commerce, Robert P. Lamont, writing for Hoover's Conference put the predicament of housing finance succinctly:

Most families have to borrow money when they buy a home. That is where the problem starts and it does not end until the family has retired the debt and owns its home free and clear. The objectives of home financing can be stated in simple terms. A long term loan, amortized through regular installment payments, should be available at all times to any family in a position to make an adequate down payment on the house and to continue regular payments of interest and principal. Interest charges should be reasonable. Loans should be made on a basis of sound appraisal and good judgment as to the borrower's capacity to pay to protect both the borrowers and the lending institutions which are trustees for the people's savings. (Gries and Ford, 1932a, vii)

Bedlam in local tax and special assessment methods and in the treatment of second mortgages was of great concern to the Hoover Conference. Again, Lamont: "Inability of home owners to meet financing charges because of special assessments and increases in taxes is listed by the Committee on Finance as among the most causes of foreclosure." Hoover Conference proceedings editors Gries and Ford called the "finance of home building, especially for second mortgages the most backward segment of our whole credit system. The whole process of purchase and finance involves a ceremony like a treaty between governments" (Gries and Ford, 1932, ix).

The Finance Committee of the Hoover conference scored appraisal methods, and called for an increase of mortgageability of housing from 50 percent of appraised value legislated by Congress, which they saw as the root cause of second mortgages, "with their exorbitant rates and frequent failures." At the time state banks could not make mortgages for greater than one year and national banks could not hold mortgages for longer than five. "The inability of the

home owner to renew such short-time mortgages in times of depression results in heavy losses to home owners and the depression of real estate values below normal levels, and is not in line with sound public policy." The Hoover Conference report called for long-term amortized loans, and recommended that mortgage payments not exceed 25 percent of the homeowner's permanent income (Gries and Ford, 1932, 23).

Hoover, in his Statement on the Proposed Establishment of Home Loan Discount Banks of November 13, 1931, stuck with the 50% loan to value (LTV) ratio limit and a 25% required down payment for short term loans, and recommended a 60% LTV ratio with a 30% down payment for long term loans (Gries and Ford, 1932, 99).

After a two month delay due to objections from both the Congressional Left and Right, and after the slow start of the voluntary National Credit Corporation, on January 22, 1932, Hoover signed the Reconstruction Finance Corporation Act, establishing an emergency government lending agency, the Reconstruction Finance Corporation (RFC) very similar to the War Finance Corporation (WFC) which had operated during the previous war and had only recently been liquidated. A number of the directors and many of the staff of WFC came on board the RFC, and within two weeks of Hoover's signature the RFC was approving one hundred loans per day, by the end of May 1932 had loaned \$500 million, and by July 1932 had "authorized 5,084 loans totalling \$1,054,184,486 to 4,196 institutions." A key Hoover provision of the bill, that the RFC could make loans to labor-producing industries which had been refused credit, was blocked by Congress. (J. Olson, 1977, 38-60).

After bitter political debate, and a presidential veto of an earlier version of the bill, the Emergency Relief and Construction Act of July 21, 1932 (Public Law 72-302) authorized the Reconstruction Finance Corporation to greatly expand the scope of its lending activities to a total just under \$2 billion. Hoover's concern over not putting the government too deeply into

debt led him to insist that the Emergency Relief and Construction Act lend to projects which were self-liquidating and which could repay their loans. Unlike the earlier structure of the RFC, which did not have to make public its lending, the provisions of the Emergency Relief and Construction Act required public disclosure, and granting of major loans became bogged down in election-year squabbles. As late as March 1933, only \$20 million had been distributed under the Act, although \$197 million in loans had been approved. The Self-Liquidating Division of the RFC set precedents for federal low-income housing and slum clearance projects to come. (J. Olson, 1977, 62-80).

According to the House Housing and Community Development Subcommittee summary of housing and community development activity (U.S. Congress, 1975, 2), two loans totalling less than \$8.5 million for housing projects--one being Knickerbocker Village in New York City and the other for rural homes in Kansas--were made by the RFC before the New Deal began.

In December of 1931 Hoover had proposed the creation of a Home Loan Discount Bank:

A scheme that would ease the flow of credit for residential construction had long been close to his heart. He had been brushed off in spring 1930 when he had attempted to persuade the Federal Reserve to take steps to permit mortgage loans to be acceptable at its discount window. By late 1931 he was ready to bypass the Federal Reserve by establishing a new facility to take on this function. Again the resources of the Treasury would be on tap to get it started. With home building depressed by one-half to two-thirds below normal levels, he saw this mechanism as a key to revitalizing the construction industry and spurring gains in employment. Congress did not share his sense of urgency. The birth of the Home Loan Discount Bank was delayed until July 22, 1932. (Barber, 1985, 132)

The Federal Home Loan Bank Act of July 22, 1932 (Public Law 72-304) established the Federal Home Loan Bank System of 12 regional banks with an aggregate capital of \$125 million, under a Federal Home Loan Bank Board (FHLBB). The Reconstruction Finance Corporation was to provide funds for initial stock purchases by the Treasury to fund the 12

banks, but the obligations of the banks were not obligations of nor guaranteed by the United States (U.S. Congress, 1975, 3), in keeping with the cautiousness of the Hoover Administration and in response to Congressional criticism of perceived federal giveaways to financial institutions.

#### 7.3.5.6 The Influence of Richard T. Ely

Marc Weiss has written persuasively of the key influence of Richard T. Ely, founder in 1920 of the Institute for Research in Land Economics and Public Utilities at the University of Wisconsin (moved to Northwestern University in 1925). As a consultant to real estate industry trade groups and to Hoover's Commerce Department, Ely helped educate a generation of housing experts, dozens of whom played key roles in the 1931 President's Conference on Home Building and Home Ownership, and later served in the alphabet soup of housing and development agencies during the New Deal (Weiss, 1989, 117, 126). Ely's statement in the inaugural issue of *The Journal of Land and Public Utility Economics* (now *Land Economics*) is interesting in the light of our commonsense focus: "Economic research is of no avail if its results cannot be brought to the attention of those who can use the results" (Ely, 1925).

#### 7.3.5.7 Influence of the Financial Lobby

The financial lobby played a key role in both the Hoover and Roosevelt administrations' efforts in the housing lending sector. According to Brumbaugh (1988, 24-25) the U.S. League of Savings Institutions almost completely "captured" the federal creation, structuring, and staffing of lending policymaking and agencies during the late Hoover and the FDR administration. Morton Bodfish, one of the first members of the FHLBB (and a colleague of Richard Ely (Weiss, 1989, 126)) stated that "practically every plan or general proposal of the League was adopted by the government in full or in modified form and thrown into the breach to stabilize the situation and prevent a sweeping collapse" (Brumbaugh, 1988, 24). Besides

having a member of the U.S. League on the original FHLBB, Title IV of the National Housing Act reflected the League's position regarding federal deposit insurance, the League "also managed to change the original draft of the Securities Act of 1933 to exempt savings and loans from its reporting requirements, and the League opposed the original version of the Banking Act of 1935, which would have allowed commercial banking institutions to make mortgage loans backed ultimately by the Federal Reserve System" (Brumbaugh, 1988, 25).

### 7.3.6 Housing Policy From New Deal to the New World Order: A Summary

#### 7.3.6.1 New Deal Housing Policy Expansion, 1933-1949.

The New Deal lending and housing legislation, expanding greatly upon and adjusting the focus of housing and finance policies which began, and stalled, under Hoover and the Seventy-Second Congress, established the structure of the financial and housing industries for the next forty years. It was clear to the leaders of New Deal housing policy that Hoover Era initiatives should not be changed so much as augmented. As the 77 year old "Brains Trust" Rexford G. Tugwell later reflected:

He [Franklin Delano Roosevelt] seems heroic to those who measure him by his predecessor, but that is because they cannot accept his amazing resemblance to Hoover--under a contrasting mask. They do not realize that both saw the same light and followed it. Hoover had wanted--nearly all the changes now brought under the New Deal label. Some of them he was unable to achieve because he was obstructed by the Democrats who came into control of the Congress at the mid-term elections in 1930 and behaved in dog-in-the-manger fashion. Others his Republican traditionalist colleagues would not countenance. So not much was done; he was marked for exile, and Roosevelt could carry on. But it was a carrying on, not a reconstruction. (Tugwell, 1968, xxii)

#### 7.3.6.2 Home Owners' Loan Corporation

The acclaimed first "Hundred Days" of newly inaugurated president Franklin Delano Roosevelt had come to an end when the Home Owners' Loan Corporation (HOLC) was established by Home Owners' Loan Act of June 13, 1933 (Public Law 73-43) to "refinance



mortgages of distressed home-owners by offering them long-term mortgage loans to be amortized by monthly payments sufficient to retire the loans within 15 years," at 5 percent interest, during the period 1933-1936 (U.S. Congress, 1975, 3). Approximately \$3 billion in loans were made to one fifth of nonfarm households and one sixth of all urban home-mortgage debt, and an Emergency Farm Mortgage Act was passed a month earlier (Chudacoff, 1981, 243). Mason (1982, 12) maintained that HOLC had rescued one million homeowners and had rescued the thrift industry by the time it went out of business, showing a modest profit, in 1936.

#### 7.3.6.3 Federal Housing Act of 1934

The Federal Housing Act of June 27, 1934 (Public Law 73-479) established the Federal Housing Administration (FHA), and unlike the earlier FHLB act, placed the full faith and credit of the United States behind debentures made by FHA prior to July 1, 1937. In addition, the Federal Savings and Loan Insurance Corporation (FSLIC) was formed to insure the accounts in housing lending institutions (savings and loans, building and loans, homestead associations, and cooperative banks) up to \$5,000. FSLIC obligations were tax-exempt until the defense-minded Public Law 77-7 of February 19, 1941. By 1940 FHA had underwritten \$4.25 billion for 3 million modernization loans, 600,000 single family homes and 600 rental units. This mortgage insurance allowed interest rates to go down to 4% and terms to go from 25 and eventually, when the program matured, to 30 years. Mortgages of the preceding 50 years had been five to seven years and rates from 6 to 12 percent (Chudacoff, 1981, 243).

The FHA ranks among the most creative, in the fullest sense of the word, of federal actions. Something relatively infrequent, the long-term mortgage for non-farm housing, was created by federal mandate and has been with us ever since. The federal government, through mortgage insurance and its entry into the secondary mortgage market, had entered a

vein in the body politic for which movement forward seemed the only permissible direction. The instability of land markets, enhanced in elasticity by short mortgages which came up for refinancing every few years and which were sensitive to even small local assessments, was significantly reduced.

The price for this wonderful new long-term debt was a fundamental strain on mortgagees, who loaned long with short deposits. Federal insurance and a secondary market plugged the gaps.

Mason (1982, 12) held that it was not only the long-term mortgage which revived the housing industry after the Great Depression, but the establishment of insurance and property standards enhancing a secondary mortgage market, the FHA forward commitments to builders making large-scale building possible, and the standardization of technical, design, and land-planning standards under FHA's first director of land planning, Seward H. Mott. Tayloresque (F. W. Taylor, 1911) belief in the efficiency of standardization lived on in the federal housing apparatus, and the standardization of mortgage insurance and the secondary mortgage markets were both the offspring and agents of further standardization.

The 1959 FHA *Minimum Property Standards* for one and two family homes, besides setting important standards for shelter, provided great impetus toward the standardization of building codes and lending.

#### 7.3.6.4 Federal Public Housing Efforts

In 1933 federal public housing took its first steps. The Emergency Housing Division attached to Public Works Administration (PWA). PWA work was done by private contractors, with fifty projects financed out of five hundred applications in four years (Chudacoff, 1981, 244). Among these projects were Jane Addams Houses in Chicago, Techwood Homes (low rental) in Atlanta, Lakeview Terrace in Cleveland, and Williamsburg Houses in Brooklyn,

totalling among them 22,000 units. Chudacoff maintained that slum dwellers were mostly pushed into other areas. The 1935 U.S. District Court Louisville Lands Case held that the federal government could not condemn private property for low-cost housing. Although subsequently reversed in 1954, this decision steered federal government toward indirect and discretionary grants-in-aid or loans to municipalities (Chudacoff, 1981, 244).

Some of the public housing created by the 1933 Act still stand, as stand the John Holabird-designed Jane Addams Homes, as a statement that the first two and three story low-rise public housing layouts were a more livable arrangement than what was to follow (Ford, 1971). Sometimes our naive first effort is actually our best.

#### 7.3.6.5 Financial Reforms

While the Hoover Era Glass-Steagall Banking Act of February 27, 1932 broadened the strength of the Federal Reserve System by allowing government bonds to be used by the system as collateral (Friedman and Schwartz, 1963, 321) it was the Emergency Banking Relief Act of March 9, 1933 which increased public confidence by founding the Federal Deposit Insurance Corporation (FDIC) and separating investment and commercial banking (Florida, 1986, x).

When confronted with the banking disaster of the early Depression years, legislators produced a remedy analogous to that attempted in the ultimate form of transportation of the day, the ocean-going steam liner, built with hatches sealing off one bulkhead from another. But like the ship, the market can threaten to sink when water spills, Titanic-style, from the top of one section into another, like water spilling from section to section in an ice tray, even when bulkhead hatches are sealed. As the "bulkheads" of one portion of federal financial legislation filled, other "bulkheads" were later to be constructed, in order to insulate one segment of the market from others. Thus Ginnie Mae was later created to help prevent Fannie Mae from failing.

#### 7.3.6.6 Greenbelt Towns's Failure and Policy Effects

The year 1935 saw the federal government's experiment with direct planning of communities under U.S. Resettlement Administration (USRA). Rexford C. Tugwell, administrator of the USRA, put it this way: "My idea is to go outside the centers of population, pick up cheap land, build a whole community and entice people into it. Then go back into the city and tear down whole slums and make parks of them" (Chudacoff, 1981, 247). Although 25 green-belt towns of 10,000 were planned, three were built: Greenbelt, Maryland, near Washington., D.C., Greenhills, near Cincinnati, and Greendale, three miles southwest of Milwaukee, completed and occupied by 1938. Paul Conkin (1959, 337) listed 10,938 units built in homesteads, agricultural communities and Greenbelt towns at unit cost of \$9,691 for a total of \$108 million by the New Deal. Thereafter Congress abolished the USRA, and after several legislative attempts failed, sold off buildings to non-profits and finally, to non-bid buyers after WWII. The "Twin totems of local independence and private enterprise" taught federal officials a lesson in politics about making the "suburbs accessible to less affluent citizens" (Chudacoff, 1981, 248). Friedman (1968, 115) emphasized the role that racial fears played in the battles over the program, citing Indianapolis as an example. "Consequently, government policies provided for 'safe' programs--mortgage insurance for those who could afford the suburbs, and second-class housing, such as PWA-constructed residences, that confined the poor to the inner city. These two priorities fixed the course of federal housing policy for the next third of a century" (Chudacoff, 1981, 249).

Four federal laws were necessary to liquidate the "Greentown" properties, and an appropriation was still listed for their inventory and liquidation in Public Law 83-428 of June 24, 1954. The moral: federal programs may be cancelled, but they can take close to twenty years to end. It would not be a surprise if probably some Greentown property in the current

inventory of the Resolution Trust Corporation, whose own letters have been chosen with an exquisite sense of the history of past remedies.

#### 7.3.6.7 The Housing Act of 1937 and Public Housing

Warner-Steagal Housing Act of 1937 created U.S. Housing Authority (USHA) authorized \$500 million for loans and grants to state and local governments for developments benefitting the lowest income third of the population. This initial appropriation produced 47,500 units, primarily occupied by black families, and one third of these were built in cities. The United States Housing Authority (USHA), a "body corporate" under the Department of the Interior, did not "itself build and manage public housing. Local housing authorities had that function" (Friedman, 1968, 106).

According to Chudacoff (1981, 246) passage of the Housing Act crystallized the debate positions between advocates of slum clearance and those who sought government loans to preserve their properties while opposing public housing as interference in private enterprise. R. Allen Hays (1985, 91) noted that the 1937 Act limited rent to 20% of income, and later an added restriction of rent levels to 20% below market levels further targeted the act to benefit those of lower income levels.

Public Housing in the 1937 "emerged relatively late in the New Deal period" (Hays, 1985, 89). Organized opposition to public housing from beginning from National Association of Real Estate Boards (NAREB), but that hungry building industry and public housing advocates held sway. War interrupted the public housing effort. "In addition, NAREB and its allies succeeded in imposing budget cuts in the late 1930's and this curtailed production" (Hayes, 1985, 89).

On June 3, 1939, the National Housing Act was amended (Public Law 76-111) to include prevailing wage requirements under Title II, sections 207 and 210. Thus public housing

more formally took on more than one program purpose, in this case the second being subsidized employment. With the Lanham Act of 1940, FHA Title VI was added, and advanced commitments of FHA approved funding were authorized (Mason, 1982, 35), allowing developers more easily to borrow from lenders for projects.

#### 7.3.6.8 Wartime policy initiatives.

Because of special war powers granted to him, President Roosevelt was able to accomplish through executive order early in 1942 what he could not through legislation, the creation of the National Housing Agency, composed of the USHA, also called the Federal Public Housing Authority (FPHA), the FHA, and the Federal Home Loan Bank system. Despite the war, FHA authorization was expanded to \$400 million in 1943 (Mason, 1982, 44). August of the year 1944 saw the passage of the G. I. Bill of Rights, presaging the 1945 Housing Act.

Meanwhile, the trade association movement grew in the housing industry. In January of 1945, the first National Association of Home Builders Convention in Chicago witnessed the conflict between NAHB and the NHA over private versus public housing priorities (Mason, 1982).

#### 7.3.6.9 Truman: Toward the 1949 Act.

When writing of the Veterans' Emergency Housing Act of 1945, it is probably not indulging too much in rhetoric to observe that not since the early Roman military leaders distributed farmland to the common men of their legions has history seen so great a proportion of a population become property owners in so short a time. Hoover's vision of the New Era and Roosevelt's vision of the the New Deal, but especially the G.I. Bill, made us a nation of homeowners. This enormous voting constituency, subsidized yearly by the federal government, has formed the basis of local public finance for two generations.

In 1946, FHA authority was increased to \$1 billion for the first time, as housing starts topped 1 million for the first time, with 1,023,000 private, 8,000 public housing starts in 1946. Single family units could not meet the postwar housing demand. In 1947, FHA Title VI Section 608 garden apartments were authorized, a program which produced 400,000 units (Mason, 1982, 47-48). In the fall of 1948, FHA Section 608 rental financing was extended to 27 years at 4% interest, and also low-cost 30 years, 5% down, 4.5% interest home loans were provided. FHA received another \$750 million authorization in January, 1948.

Public housing, however, was nearly still-born, and it might be said that it has not recovered from the trauma of its birth. As a measure of the weak support for public housing, in 1948, the Taft-Ellender-Wagner bill for public housing died in committee. Conventional housing, on the other hand, benefitted from federal largesse.

According to J. Paul Mitchell (1985, 10-13), the 1949 Housing Act was a landmark, stating the goal of a "decent home" for every American. Congress under this Act ultimately authorized 810,000 public housing units during the next six years, although far short of the original goal. The 1949 Act was a landmark also in terms of unmet expectations. Of the 810,000 authorized units, by 1960 only 250,000 were available for occupancy. The pattern did not change significantly. Between 1968 and 1973, 375,000 public housing units were built, compared with 470,000 built from 1949 to 1967. And in the years 1949 to 1979, only about 1 million public housing units had been built, while urban renewal since 1954 had destroyed many more units than it replaced (Mitchell, 1985, 10-13). Ironically, a good number of these publicly subsidized units were built during the administration of a Republican president. Hays maintained that the first four years of the Nixon administration saw the "most massive boom in construction of federally subsidized housing which had ever occurred" (Hays, 1985, 110).

Even this retrenched number of housing units proved beyond the limited resources devoted to them. Because of these limited resources, the construction and maintenance costs of this inventory led to cash flow problems, complaints of corruption, and fears of default by strapped local housing authorities. President Nixon declared a moratorium in 1973 on new public housing authorizations. While the Ford and Carter administrations saw increased public housing production under Section 8 funding, the production levels of the Nixon years were never reached. With the "death" of Section 8 new construction under President Reagan, direct federal construction of public housing virtually ended.

#### 7.3.6.10 Summary of New Deal Housing Production.

Figure 11 displays annual housing construction from 1930 to 1950 taken from U.S. Census (1976, 639-640) historical data.

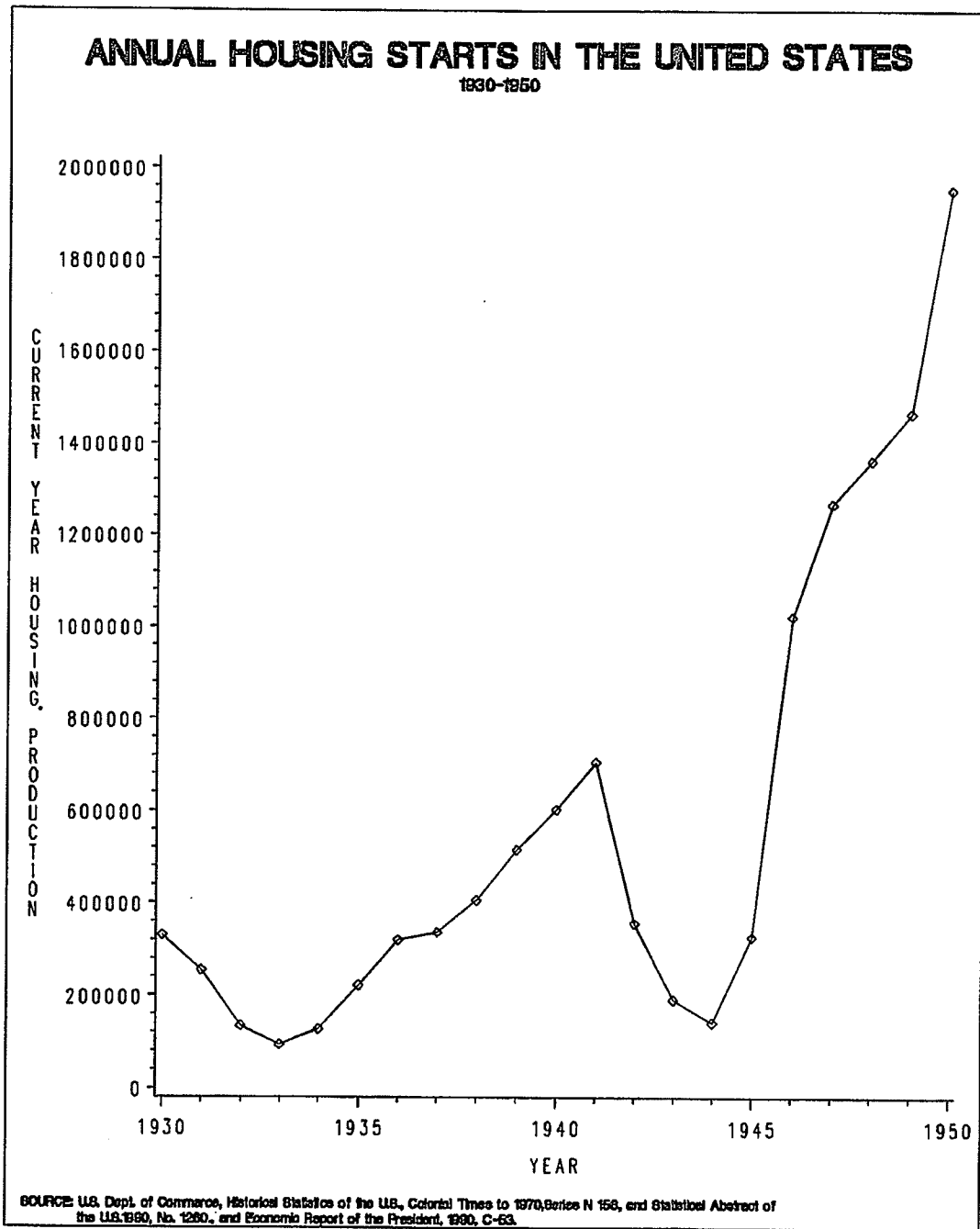
#### 7.3.6.11 Housing Policy Constructed

With the 1949 Act, FNMA was authorized to provide a secondary market for VA and FHA mortgages. With this Act the basic structure of federal housing policy had been established, but many accessories and repairs, not always successful, remained to be added.

The subsequent history of housing policy expands upon these original efforts, reaching points of impasse on some, contradiction and confusion on others, retrenchment on many. The New Deal iconography of a nation of homeowners, with the stated 1949 policy goal of decent housing for all Americans, shapes our continuing commonsense discourse on housing policy. Since 1949, a number of Commissions and laws have shifted the vocabularies of housing policy, such as the Housing Act of 1954, which changed the concept of slum clearance, or "Urban Redevelopment" to "Urban Renewal" (Hays, 1985, 178). But the massive priorities of housing policy did not change, whether after the Kaiser Commission (1968), the Nixon Era Public Housing Moratorium (1973), the Reagan Era President's Commission on Housing



Figure 11. Annual Housing Construction in the United States, 1930-1950.



(1982), and the National Housing Task Force leading up to the Cranston-Gonzales Housing Act of 1990. Vocabularies shifted, and funds were shuffled among smaller constituencies, but the bulk of the assets--both present and promised--go where they began to go from the beginning--the American home owner. Our housing policy rhetoric continues to obscure this fact.

Moreover, federal housing reviews have a way of repeating themselves. The review commissioned by President Nixon produced a scathing criticism of housing policy prior to that date as "a hodge podge" and full of "internal inconsistencies, numerous duplications, cross-purposes, and overlaps as well as outright conflicts and gimmickry" (HUD, 1974, 22-25)--a fair description of the many tales housing policy is called upon to tell.

The Mortgage Interest Deduction has been woven into this mythology as part and parcel of the right to decent housing--the right to a tax deduction for one's housing. But the generations of Americans owning homes after World War II have perhaps been mistaken in a view that they share a right universally held by their forebears. Marc Weiss recently pointed out in an interview that it was only during and after World War II that a significant portion of the American middle-income population paid a significant income tax, which previous to that war only had touched about one-fifth of the population (Lehman, 1991).

As for the housing policy structure itself, it is comprised, ordered in descending order of resources, of:

1. generous mortgage insurance and secondary market mechanisms,
2. market regulation along the lines of both New Era standardization and New Deal reallocation,
3. an expansion both in dollars and in terms of homeowner tax preferences,
4. and lukewarm support for public housing, confounded by political rent-seeking,

has not been fundamentally changed since 1949.

Housing subsidies, while growing in some areas, have increased only in increments relative to the massive assets devoted to the other components of housing policy. Some effort has been made to allocate funds only to low-income households, but a massive backlog of supports for middle- and upper-income households will continue to overshadow such an effort for many years.

This lopsided structure is indeed our national housing policy. When critics state "There is no housing policy," perhaps it is because the policy is not near where we would like it to be in terms of service to the poor. But the targeting of over \$1 trillion in contingent liabilities and direct spending to housing indicates that an enormous consensus for housing supports has driven the political process for several generations to produce these results. There is some logic to how housing policy came to be, even if you don't like the logic.

#### 7.3.6.12 Making Sense, Sense Common, and Common Sense about Housing Policy.

In order to **make sense** about housing policy, I propose creating a "generic" graph of this housing policy according to proportions of assets both promised and spent, and contrasting this "generic" graph with one representing housing needs.

Constructing a "generic" housing needs graph is quite difficult due to the politization of the vocabulary of housing needs. Just as little children in Ireland declare their partisanship by calling their town either "Derry" or "Londonderry," so do analysts when they speak of housing needs. If you use the words "housing crisis" or "low-to-moderate income," or "homeless," each one of these words is charged by debates about measurements of welfare, wealth, and population. Yet, even if these graphs must be heavily footnoted, they will prove to be useful for the building of housing policy through the stage of what I call **making sense common**, public discourse using a common verbal and graphic vocabulary on these issues. Since in some areas of housing policy no common vocabulary exists, it is necessary to invent one before further progress can be made, a process which this work can only begin.

Using graphs and other "generic" tools, we can begin to build common wisdom about housing policy, or to **making common sense** about housing policy.

Why is such an approach necessary? It is my contention that for the past two decades, housing policy has been caught in a "deadly embrace" between contending political factions. This impasse is tied closely to the forces preserving the Mortgage Interest Deduction.

#### 7.3.7 Tabular Summary of Major Federal Programs for Housing

Since the object of this exercise is not to write a complete history of United States housing policy, but to situate the question of the Mortgage Interest Deduction within a wider commonsense context, at this point our discussion will connect the account of early housing policy history to the present first by means of summary tables and then by means of thematic "stories." I thus spare my readers a longer narrative by presenting the following summary table

Table XII:

TABLE XII  
OVERVIEW OF MAJOR FEDERAL PROGRAMS FOR DIRECT HOUSING ASSISTANCE

YEAR AUTHORIZED	PROGRAM	STATUS	TYPE OF SUBSIDY	DESCRIPTION	HOUSEHOLD PAYMENT	HOUSEHOLDS ASSISTED AS OF 9/30/87 (THOUSANDS)	FUNDING FOR FISCAL YEAR 1988
	RENTAL ASSISTANCE PROGRAMS						
1937	Public Housing	Active	Project-based	Pays for developing and modernizing projects owned by local PHAs. Before 1987, funds paid off debt-service costs over 20 to 40 years. Costs are now financed with up-front grants. Since 1969, has also paid the difference between the projects' operating costs and rent collections.	Generally 30% of adjusted income	1,390	\$433 million for 6,243 new units; \$1 million for modernization; and \$1,618 million for operating subsidies.
1959	Section 202	Active	Project-based	Provides loans for up to 40 years to nonprofit sponsors to finance construction of rental housing for the elderly and handicapped. All projects built since 1974 also receive Section 8 rental subsidies.	Generally 30% of adjusted income	153	\$480 million of loan authority for new units.
1961	Section 221(d)(3) Below-Market Interest Rate(BMIR)	No new commitments since 1968	Project-based	Provides up-front subsidies that reduced to 3% the interest rate on private 40-year mortgages for multifamily rental housing built by nonprofit or limited-dividend organizations. Reduces rents for income-eligible tenants.	Fixed rent sufficient to cover mortgage payments and other allowable costs	150	n.a.
1962	Section 515 Rural Rental Assistance	Active	Project-based	FmHA provides 50-year direct loans to developers at 1% interest. Reduces rents for income-eligible tenants. Some very poor tenants receive supplementary assistance through the rural RAP and Section 8 programs.	Generally, the greater of a basic rent covering mortgage payments and allowable costs, or 30% of adjusted income	349	\$555 million of loan authority for about 16,700 new units.
1965	Rent Supplement	No new commitments since 1973	Project-based	Reduces rents for income-eligible tenants in housing projects insured under certain FHA mortgage insurance programs. Most outstanding commitments have been converted to Section 8 assistance.	The greater of 30% of adjusted income or 30% of unit's rent	23	n.a.

Notes on last page of table.

(Continued)

YEAR AUTHORIZED	PROGRAM ORIGINATED	STATUS	TYPE OF SUBSIDY	DESCRIPTION	HOUSEHOLD PAYMENT	HOUSEHOLDS ASSISTED AS OF 9/30/87 (THOUSANDS)	FUNDING FOR FISCAL YEAR
RENTAL ASSISTANCE PROGRAMS (Continued)							
1988	Section 236	No new commitments since 1973	Project-based	Provides monthly subsidies that reduce to 1% the interest rate on private 40-year mortgages for new multifamily rental projects. Reduces rents for income-eligible tenants. Since 1974, some tenants get larger subsidies through the RAP program. Many RAPs have been converted to Section 8 assistance.	Similar to Section 515	528	n.a.
1974	Section 8 New Construction and Substantial Rehabilitation	No New commitments since 1983, except for elderly and handicapped families	Project-based	Provide rental subsidies to income-eligible households in new or substantially rehabilitated projects. Subsidy covers the difference between tenants' payments and FMR, determined by HUD and based initially on capital and operating costs. Subsidy contracts for 20 to 40 years commit owners to set aside a certain number of units for lower-income households for a period of time. Tax incentives and financing arrangements also may reduce owners' effective mortgage interest rates.	Generally 30% of adjusted income		\$1,325 million for 9,500 new units.
1974	Section 8 Loan Management Set-Aside and Priority Disposition	Active	Project-based	Provide subsidies to units in financially troubled projects in the FHA-insured inventory and on sale of HUD-owned projects, respectively. Five-to-fifteen-year subsidy contracts with owners help ensure improved cash flows and preserve projects for lower-income tenants. Subsidies cover the difference between tenants' payments and the units' rents, which often are below-market rents because of other federal subsidies.	Generally 30% of adjusted income		\$453 million for 414(a)
1974	Section 8 Conversion Assistance	Active	Project based	Provides 15-year subsidies to some dwelling units in projects formerly aided through other types of programs—primarily the rent supplement and RAP programs. Subsidy mechanism similar to Section 8 loan management.	Generally 30% of adjusted income		No new funds appropriated.

(Continued)

Notes on last page of table.

YEAR AUTHORIZED	PROGRAM	STATUS	TYPE OF SUBSIDY	DESCRIPTION	HOUSEHOLD PAYMENT	HOUSEHOLDS ASSISTED AS OF 9/30/87 (THOUSANDS)	FUNDING FOR FISCAL YEAR 1989
RENTAL ASSISTANCE PROGRAMS (Continued)							
1974	Section 8 Existing Housing Certificates	Active	Household-based	Aids income-eligible households, who can choose any existing unit that meets the program's property standards and whose rent does not exceed the FMR. HUD pays difference between units' actual rents and tenants' payments, with funding committed for 5 to 15 years. Administered by local PHAs, who enter contracts with landlords.	Generally 30% of adjusted income	874	\$542 Million for 18,000 new units with 5-year terms and 430 million for 333 new units with 15-year terms designed to replace units lost because of public housing demolition.
1979	Section 8 Moderate Rehabilitation	Active	Project-based	Aids households in existing units brought up to standard with modest repairs. Differs from Section 8 existing-housing program only in that aid is tied to the rehabilitated unit whose rent is limited to 125% of the local FMR for existing units.	Generally 30% of adjusted income	76	\$323 million for 2,942 new units and \$45 million for 1,270 single-room-occupancy units for the homeless.
1983	Section 8 Vouchers	Active	Household-based	Similar to Section 8 certificate program in that assisted households can live in standard units of their choosing and PHAs administer the program. Unlike certificates in that recipients may occupy units with rents above the voucher payment standard—roughly equivalent to the FMR—if they pay the difference, and may keep the difference if rents are below the payment standard. Funding committed for 5 years.	Generally 30% of adjusted income plus or minus the difference between units' rents and payment standard.	82	\$1,276 million for 47,000 new units and \$79 million for 3,099 units replacing units lost because of landlords' opting out of programs or expiring contracts.
1983	Rental Housing Development Grants (HoDAG)	Terminates 9/30/89	Project-based	Awards grants through national competitions among eligible state and local governments to help finance new construction and substantial rehabilitation of rental housing. Projects must reserve at least 20% of units for 20 years for lower-income tenants; grants cannot exceed 50% of total costs of developing the projects.	No more than 30% of adjusted income of a family whose gross income equals 50% of area median income adjusted for family size	7b	No new funds appropriated.

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(Continued)

YEAR AUTHORIZED	PROGRAM ORIGINATED	STATUS	TYPE OF SUBSIDY	DESCRIPTION	HOUSEHOLD PAYMENT	HOUSEHOLDS ASSISTED AS OF 9/30/87 (THOUSANDS)	FUNDING FOR FISCAL YEAR 1989
				RENTAL ASSISTANCE PROGRAMS (Continued)			
1983	Rental Rehabilitation Grants	Active	Project-based	Distributes grants by formula to eligible units of government to help fund moderate rehabilitation of rental housing. Also provides vouchers to current lower-income tenants who may choose to remain in the building or to relocate. Grants generally limited to between \$5,000 and \$8,500 per unit, depending on number of bedrooms, and cannot exceed 50% of the total rehabilitation. At least 70% of units must be occupied by lower-income households, with specified shares going to large families.	Similar to HoDAG 39c		\$150 million.
				HOMEOWNERSHIP ASSISTANCE PROGRAMS			
Section 502 1949	Rural Housing Loans	Active	n.a.	Provides reduced-interest (as low as 1%) direct loans, generally with 33-year terms, to rural lower-income homebuyers. Households with incomes somewhat above income-eligibility cutoff (80% of area's median income adjusted for family size) may obtain direct loans roughly at the long-term federal borrowing rate, which is typically below private mortgage rates.	At least 20% of adjusted income for mortgage payments, property taxes and insurance.	899	\$1,267 million in loan authority for about 27,000 loans.
Section 235 1968	Mortgage-Interest Subsidies	Terminals 9/30/89	n.a.	Provides mortgage insurance and interest subsidies to private lenders on behalf of low- and moderate-income homebuyers—those with incomes below 95% of area's median income adjusted for family size. Characteristics have changed several times, with subsidies becoming more limited and their term being reduced. As authorized in 1983, interest subsidies are provided for 10 years, and the implicit interest rate cannot fall below 4%.	At least 28% of adjusted income for mortgage payments, property taxes, and insurance.	159	No new funds appropriated.

a. No reliable data are available for separate breakdowns of households assisted by Section 8 loan management, property and conversion assistance. The figure of 414,000 is the total for all three components.

b. Number of units targeted specifically for lower-income households and for which funds had been obligated. Funds for a total of 24,000 units have been obligated through 1987.

c. Estimated number of units occupied by lower-income households. A total of 41,638 units were completed with grants through 1987.



Left out of Table XII are the few hundred millions allocated to homeless assistance under the McKinney Act of 1989, and the as yet unfunded promises of the Cranston-Gonzales Housing Act of 1990.

#### 7.4 Housing Policy Stories Claiming Perceptual Certainty

The following "stories" of housing policy claim a degree of perceptual certainty. This is by no means an exhaustive list, but they form important background to any comprehensive change proposed in housing policy.

##### 7.4.1 Central Versus Local Control of the Dough

*Central (state, federal) versus local (municipal) control of housing funds and a cycle of government abandonment as "the cracks" (those into which things fall) widen between contending government interests during said cycle.*

As federal housing policies developed, not only was the federal administrative apparatus stretched by the task of coordinating far-flung efforts, but states and municipalities, closer to their own problems and constituencies, demanded more local control. Once the principal of local control was established, then the question of who would control the funds--state or municipality--rose to the fore. A number of mechanisms, such as revenue sharing, block grants, and action grants have been attempted. Each lives on in some limited way in federal development policy.

The Housing and Community Development Act of 1974 which followed the 1974 housing policy review departed in structure from earlier housing legislation. Funds for several housing and urban programs were combined into block grants given directly to municipalities, which then supervised and redistributed the moneys. Another major feature of the 1974 Act was the Section 8 rent subsidy program. It was the intent of Congress that these subsidies would allow Section 8 renters to find "scattered" housing with private landlords to avoid being concentrated

in public housing (Mitchell, 1985, 16). The expectation that municipalities would control their own funds to produce their own scattered public housing led to results as contradictory as were the expectations.

Today the question of the proper conduit for federal funds--state or municipality--is again before Congress. The Bush Administration supports the idea of federal development aid going to the states.

A sub-theme in this particular story has been the attempts to coordinate regional housing policy, but historically these have been short-lived, e.g., the post of the Housing Expediter, who had limited powers in this area, was cancelled right after the war (Executive Order 9686, January 26, 1946), and the various regional coordinating attempts, such as the "metropolitan expeditors" created by the Demonstration Cities and Metropolitan Development Act (Public Law 89-754 of November 4, 1966), and funds for Section 204 of that same Act for coordination of federal aid in metropolitan areas, were not funded under the Department of Housing and Urban Development Appropriation Act for fiscal 1968 (Public Law, 90-121, of November 3, 1967). That the coordination of federal activities and their accompanying funds on the regional level has been intensely conflictual has not served housing and development policy effectiveness well. The possibility of akratic or pseudo-akratic action warrants further investigation.

#### 7.4.1.1 "Funding Is Just Around the Corner"

As funding mechanisms have shifted, state and local governments have tended to place too much hope in that next big Federal Housing Act just around the corner to provide rehab and other housing funds. But more often than not, like the most recent Act, funds are promised which will never be appropriated. Neighborhoods then continue to suffer by playing the federal housing policy "lottery for the poor," beguiled into making unrealistic neighborhood plans,

assuming, of course, one's own particular neighborhood or town will have a lucky day at the appropriations races. With funding cut drastically, it is much more realistic to base local plans on past-- and not imagined--funding, and to make choices, not accidents. These local choices are difficult, and some municipalities have taken to stalling housing programs in red tape.

#### 7.4.2 Terms Balloon Expands with Supply of Hot Air

*The steady, incremental liberalization since 1932 of federal housing terms--loans, interest rates, down payments, qualification schedules, loan to value ratios, insurance coverage, etc., along with the growth of secondary market mechanisms necessary to guarantee the expanding debt--FNMA, GNMA, etc., thus accelerating the effects of financial markets on housing.*

Few terms possible involved in the private acquisition, development, rental, or purchase of housing have not been incrementally liberalized by federal legislation. As these terms have been liberalized, and the pool of those served by housing policies has grown, more secondary market mechanisms have been necessary to keep these federal market interventions afloat. This expansion has been accompanied by something of an attenuation, or "stringing out" of available federal housing resources among a trail of still-living but phasing-out housing programs.

##### 7.4.2.1 Banking Regulations.

One easy way to view the incremental liberalization of policy terms is to view the history of federal deposit insurance premiums:

TABLE XIII  
HISTORY OF CHANGES IN FEDERAL DEPOSIT INSURANCE PREMIUMS AND  
COVERAGE

YEAR	FEDERAL SAVINGS AND LOAN INSURANCE CORPORATION	FEDERAL DEPOSIT INSURANCE CORPORATION
1933		BANKING ACT OF 1933: Premium set at 1/2 of 1 percent of total insured deposits. One-half of total assessment paid upon admission to the fund, the remainder subject to call. Authority granted to impose special assessments, if necessary. Basic insurance coverage set at \$2,500 per depositor per insured institution. Effective July 1, 1934, insurance coverage was increased to \$5,000, except for mutual savings banks, which could remain at a coverage of \$2,500.
1934	NATIONAL HOUSING ACT: Annual premium set at 1/4 of 1 percent of the total amount of all accounts at insured institutions plus any creditor obligations. Premium assessed annually until a reserve fund equal to 5 percent of all accounts plus creditor obligations is established. Authority granted to improve special assessments, if necessary. Basic insurance coverage set at \$5,000 per depositor per insured institution.	
1935	HOME MORTGAGE RELIEF ACT: Premium reduced to 1/8 of 1 percent. Maximum special assessment reduced to 1/8 of 1 percent.	BANKING ACT OF 1935: Premium assessment base changed to all domestic deposits and reduced to 1/12 of 1 percent per annum. maximum emergency borrowings from the Treasury are \$975 million, and emergency assessment rights are eliminated.
1947		AMENDMENT TO BANKING ACT OF 1935: Line of credit at the Treasury increased to \$3 billion.
1950	AMENDMENT TO THE NATIONAL HOUSING ACT: Premium reduced to 1/12 of 1 percent. Maximum special assessment remains at 1/8 of 1 percent. Line of credit at the Treasury insurance coverage set at \$10,000 per account.	FEDERAL DEPOSIT INSURANCE ACT: Premium rebates set at 60 percent of net assessment income. Basic insurance coverage raised to \$10,000 per account.
1960		AMENDMENT TO THE FEDERAL DEPOSIT INSURANCE ACT: Rebates increased to 66.66 percent of net assessment income.
1961	AMENDMENT TO THE NATIONAL HOUSING ACT: Established secondary reserve, a prepayment reserve with a 2 percent annual assessment on anticipated net increases in total deposits.	

(Continued)

Table XIII Continued.

YEAR	FEDERAL SAVINGS AND LOAN INSURANCE CORPORATION	FEDERAL DEPOSIT INSURANCE CORPORATION
1966	FINANCIAL INSTITUTIONS SUPERVISORY ACT OF 1966: Basic insurance coverage raised to \$15,000 per account.	FINANCIAL INSTITUTIONS SUPERVISORY ACT OF 1966: Basic insurance coverage raised to \$15,000 per account.
1969	CREDIT CONTROL ACT: Basic insurance coverage raised to \$20,000 per account	CREDIT CONTROL ACT: Basic insurance coverage raised to \$20,000 per account
1973	AMENDMENT TO THE NATIONAL HOUSING ACT: Eliminated payment into secondary reserve.	
1974	AMENDMENT TO FEDERAL DEPOSIT INSURANCE ACT: Basic insurance coverage raised to \$40,000 per account.	AMENDMENT TO FEDERAL DEPOSIT INSURANCE ACT: Basic insurance coverage raised to \$40,000 per account. Insurance limit for time and savings accounts held by state and political subdivisions increased to \$100,000.
1978		FINANCIAL INSTITUTIONS REGULATORY AND INTEREST RATE CONTROL ACT OF 1978: Insurance limit for Individual Retirement Accounts (IRA) and Keough accounts raised to \$100,000.
1980	DEPOSITORY INSTITUTIONS DEREGULATION AND MONETARY CONTROL ACT OF 1980: Basic insurance coverage raised to \$100,000 per account.	DEPOSITORY INSTITUTIONS DEREGULATION AND MONETARY CONTROL ACT OF 1980: Basic insurance coverage raised to \$100,000 per account. Rebates decreased to 60 percent of net assessment income.
1985	ADMINISTRATIVE ACTION: The Bank Board levied a special assessment (1/8 of 1 percent annually) against FSLIC-insured institutions for the first time.	
1989	FINANCIAL INSTITUTIONS REFORM, RECOVERY, AND ENFORCEMENT ACT OF 1989: FSLIC abolished, replaced with Savings Association Insurance Fund (SAIF) administered by FDIC. Premiums to be 5/24 of 1 percent in 1990 (1/12 of 1 percent plus special assessment of 1/8 of 1 percent), 23/100 of 1 percent in 1991-1993, 18/100 of 1 percent in 1994-1997, and 15/100 of 1 percent after 1997.	FINANCIAL INSTITUTIONS REFORM, RECOVERY, AND ENFORCEMENT ACT OF 1989: FSLIC abolished, replaced with Savings Association Insurance Fund (SAIF) administered by FDIC. FDIC to administer original fund now called Bank Insurance Fund (BIF). Premiums increased to 12/100 of 1 percent in 1990, 15/100 of 1 percent after 1990. In 1998, both BIF and SAIF are to have same premium.

SOURCE: Congressional Budget Office (1990, 34-35).

#### 7.4.2.2 Tabular Summary of the Federal Liberalization of Housing Terms

Having viewed the progressive liberalization of terms in the banking area, I offer here a more general summary of housing terms. Table XIV summarizes the federal liberalization of terms pertaining to the development, acquisition, rental, and purchase of housing since 1932:

TABLE XIV  
SUMMARY OF FEDERAL LIBERALIZATION OF HOUSING TERMS

AREA OF INTERVENTION	WHERE IT BEGAN		WHERE IT ENDED	
Home Mortgage Term	1-5 Years		30 Years	
Mortgage Interest Rates	2%		Uncapped	
Down Payments	30%		None, in some cases	
% of Income for Housing	20%		50%, in some cases	
Insurance Scope	Repair Cost		Replacement Cost	
Federal Rent Control	War Powers		None, except for public	
Total Housing Guarantees	\$200 million		> \$1 trillion	
Deposit insurance rates	Quarter of 1%		Twelfth of 1%	
Vacation Homes	No FHA Insurance		FHA insured	
Closing Points	3 +		Sliding to None	
Mortgage Interest	Deductible		Capped @ \$1 million principal	
Local taxes	Deductible		Deductible Formula Modified	
Construction Wages-Federal	Unregulated		Prevailing Wage	

Source: Public Laws, summarized by Albert Schorsch, III.

As federal intervention liberalized housing market terms, something had to give, and that something was principally the "uncapping" of interest rates. This action tied housing markets even more directly to financial markets, reducing lag-time in housing market reaction to overall financial market conditions. When the Federal Reserve "pulled the plug" on cheap money in 1952, below market VA and FHA loans dried up, the President at that time not having direct authority over those rates, a power given him by the Housing Act of 1953. When the Fed loosened money in 1953 (Mason, 1982, 64), the reaction was swift.

Although mortgage interest rates can also display a seasonal "stickiness" due, for example, to the spring and fall homebuying seasons--remaining high even when other market interest rates have fallen--they tend to anticipate the rise of other long-term interest rates. It would make sense, therefore, to examine whether there are any rational expectations effects evident in mortgage interest rates and housing markets in general after these rates were "uncapped" as opposed to before.

Another phenomenon seems to have occurred: just about all terms that could be liberalized--that are large enough to make any difference--already have been. In this situation, it might be suspected that the housing policy might begin "feeding on itself"--shuffling resources from one policy area to another while maintaining the appearance of not doing so--in order to preserve political interests served by previous and inevitably expanding rhetoric. This angle will be taken up in the final "story" in this chapter.

The now dialoging positions of the Chicago School "regulation" and the Virginia School public choice "rent-seeking" theorists can be extended into this area of housing policy. There is a mutual "capturing" going on between the regulators and the regulated. As policy matures, the regulated become the taxed. This we have seen in public housing, where residents are taxed indirectly through rents and deferred maintenance due to lack of funding. It can also be



seen in Section 221(d)(3) expiring contracts, wherein investors and owners are taxed by forcing them to keep the buildings as public housing longer than the original contracts. In the latter case, if the 1990 Housing Act is appropriated, there will be some relief to owners in the form of three options. Recipients, because of their being tied to a particular place, are eventually taxed in some way through their rents or loss of living standards to fund their own program--perhaps not directly, as are Social Security recipients, but taxed nonetheless.

Interestingly, the process of "feeding on itself" has a financial parallel. Previous to the growth of mortgage backed securities, the problem of housing finance revolved around the dilemma: how to lend long when savings deposits are short. Now the problem has become: finding someone to buy short something that is long.

#### 7.4.3 The Housing Policy Lottery

*Nominally expanded services for nominally less money, both in the gradual reduction of visible up front fees from housing recipients and in monies appropriated for actual implementation, resulting in the housing policy "lottery" (Sternlieb and Listokin, 1987, 36) in which a fraction of those eligible for aid receive it.*

As housing terms have nominally eased somewhat, the population with nominal access to such terms in cases of public assistance for housing has been forced to compete among themselves for housing services, with most losing.

The Congressional Budget Office (1988) reported that roughly one third of those eligible for housing aid are receiving it, and an enormous partisan literature exists in this area over the accuracy of this figure, the most recent reconstitution of the housing "crisis" debate.

#### 7.4.4 Specialization Versus Generalization

*The tug of war between focused and systemic solutions: ad hoc programs are created, then recentralized into bureaucratic apparatus in "memory" form near the end of their precipitating crisis.*

This process takes place in many bureaucracies. The evolution of the Department of Housing and Urban Development itself from the bones of the RFC and the HOLC, the later NHA, and the flesh of the HHFA, which oversaw from time to time to some degree FHA, FHLBB, PHA, and FNMA--was itself only the larger manifestation of this process, as displayed in Table XV:

TABLE XV  
FEDERAL HOUSING AGENCIES

YEAR	AGENCY/DIRECTOR	COMMENT
1934	Federal Housing Administration	
1937	U.S. Housing Authority	
1942	National Housing Agency	FHA & USHA merger
1947	Housing and Home Finance Agency Raymond M. Foley	FHA, FHLBB, PHA
1955		FHLBB separated
1965	Department of Housing and Urban Development	
1966	Director Robert C. Weaver	
1969	George W. Romney	
1973	James T. Lynn	
1975	Carla A. Hills	
1977	Patricia R. Harris	
1979	Moon Landrieu	
1981	Samuel R. Pierce, Jr.	
1989	Jack Kemp	

(Schorsch, from public documents).

In addition, real property, not simply programs, concretizes the federal bureaucratic memory. Housing created with federal aid cycles and recycles through HUD foreclosure sales.

The Resolution Trust Corporation is this phenomenon writ large, a dragnet which drew up sixty years of residue from federal housing policies by scraping the bottoms of financial markets.

#### 7.4.5 Market Interactions Change Policy Results

*Focusing a federal housing program is difficult because its implementation is subject to interplay of, among many others, legislative agendas, agency regulation, local governments, and financial markets, which each "squeeze the balloon" into something not resembling the symmetry originally intended.*

##### 7.4.5.1 Reagan Era Policies.

According to the now-celebrated final 87-page report of Reagan-era Housing Secretary Samuel Pierce, (HUD, 1989), the major accomplishment of federal housing policy during the Reagan-Pierce years was the reduction of the assisted housing debt, "the total amount of money the Federal government owes States, banks, developers, public housing agencies, owners, and individuals to support housing for the families receiving housing assistance," by over \$45 billion to just under \$200 billion, and by increasing the number of HUD-assisted families from 3.2 million to 4.3 million. This was accomplished by the termination of the Section 8 New Construction program and by federal housing allowance and voucher initiatives. A housing voucher demonstration program was authorized in the Housing and Urban/Rural Recovery Act (HURRA) of 1983 and vouchers were made a permanent program of HUD in the Housing and Community Development Act (HCDA) of 1987. By late 1988, 150,000 families were using vouchers.

But by far the most economically significant policies of HUD during the Pierce years were the raising of the ceiling on FHA total insurance from \$40 billion in 1981 to \$96 billion in 1987, and the increase in Government National Mortgage Association (GNMA) issuance of mortgage-backed securities from \$111 billion in 1981 to over \$500 billion by the end of 1988 (HUD, 1989, 3).

#### 7.4.5.2 They Just Fade Away

Remnants of programs being phased out--this can take almost forty years--represent the accumulation of decades of legislated programs. Many of the various "Section" programs of the acts listed in Table XII exist in a "phase-out" form, with Section 8 intended to replace older sections, the Reagan-years design being to replace Section 8 with vouchers, with the ultimate goal of some housing analysts being the integration of all housing and welfare transfers into one system (Newman and Schnare, 1988).

According to the General Accounting Office (GAO), the interplay of financial pressures to enhance bond ratings upon local housing authorities, through whom Section 8 funds were channeled, helped to focus Section 8 limited dividend new construction funding more substantially on the elderly than had been the case for Section 236 funding (GAO, 1980). Such interactions of market and program are common, especially when local housing authorities must turn to financial markets for the sale of their debentures. The market favors certain forms of investment, depending on economic conditions, and these forms become the pathways through which program funds flow.

#### 7.4.5.3 Regional Nature of Housing Markets.

Another sub-tale of the difficulty of forming national housing policy is that certain regions clearly dominate the new-home and the resale markets. The following four pictures will spare you the next four thousand words. Figure 12 depicts sales of existing housing in 1988, and Figure 13 depicts housing starts authorized in 1987.

Figure 12. Existing Home Sales by State, 1988

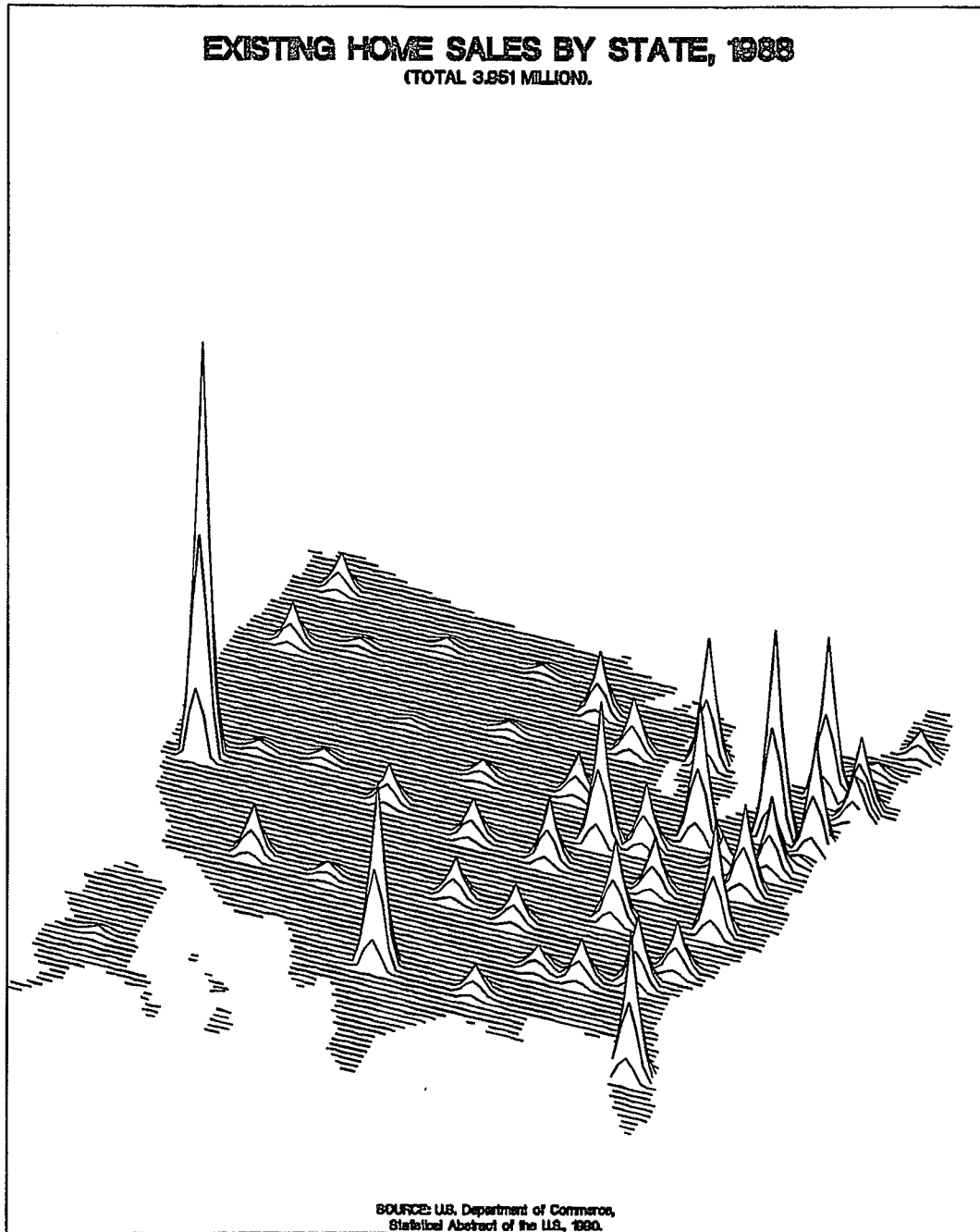
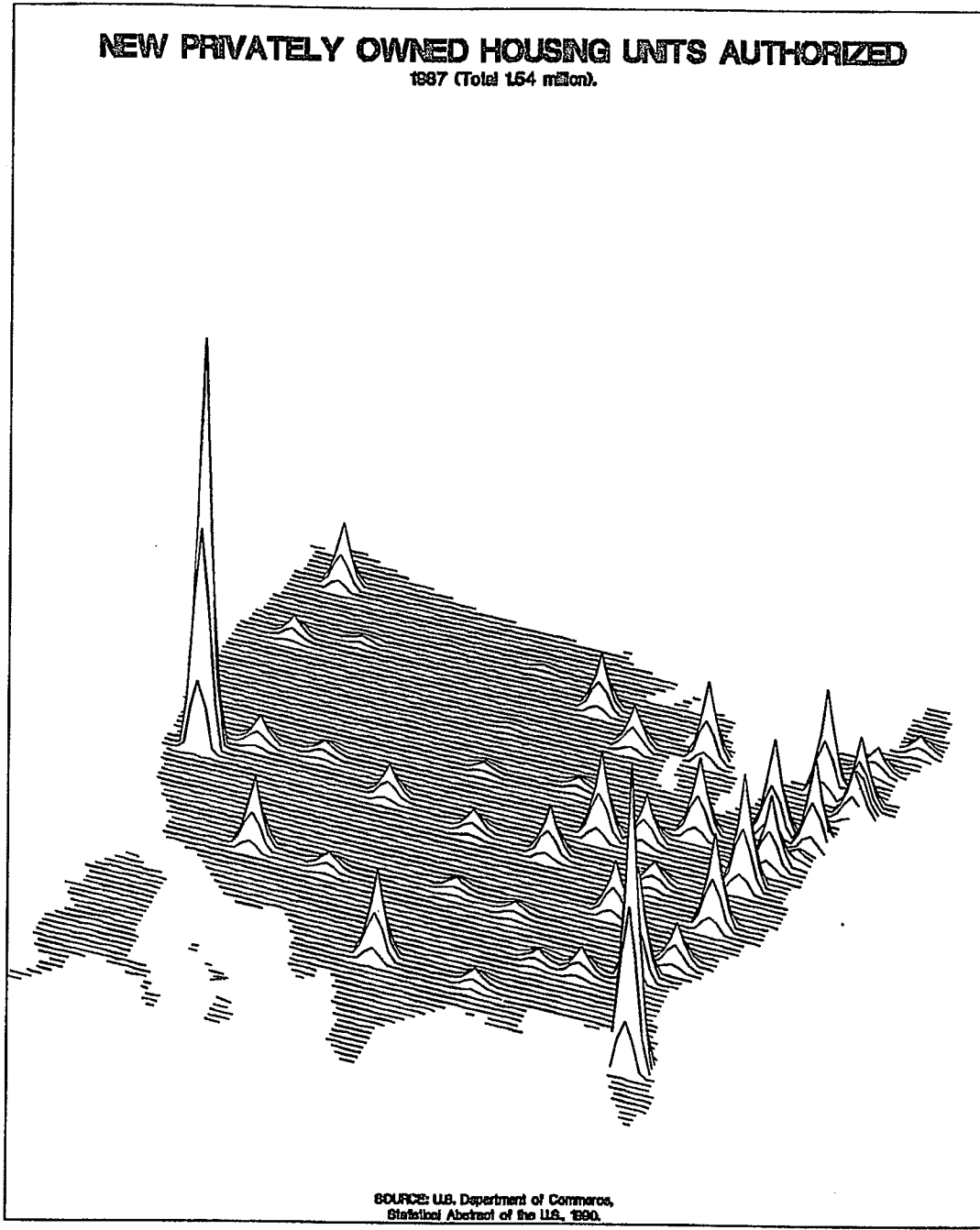


Figure 13. New Privately Owned Units Authorized, 1987



Anyone looking at these maps can guess which regions have the wealth to set agendas for national housing policy. The following two maps depict which states receive the bulk of 1988 HUD low income housing assistance and community development funding respectively.

Figure 14. HUD Low Income Housing Assistance by State, 1988.

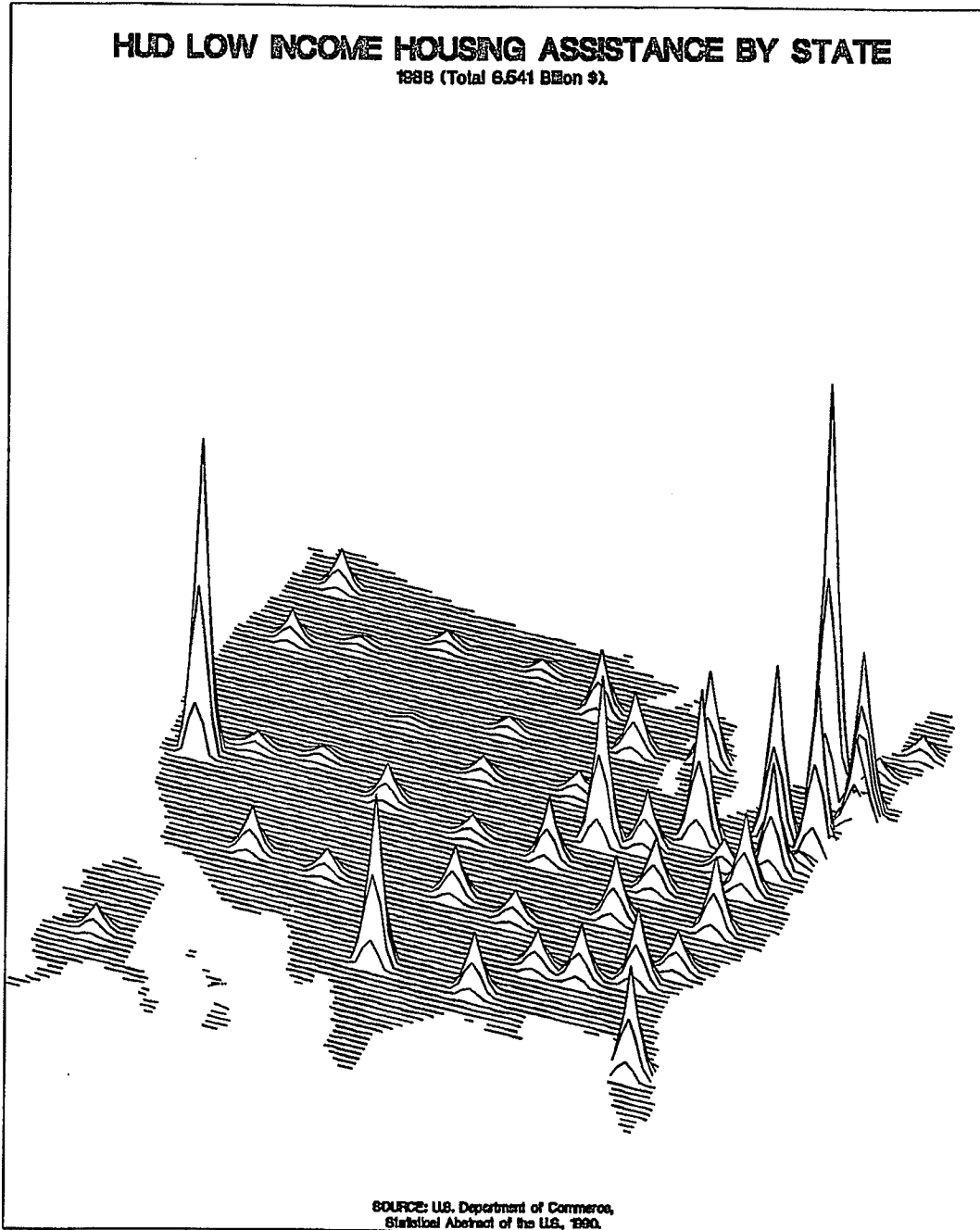
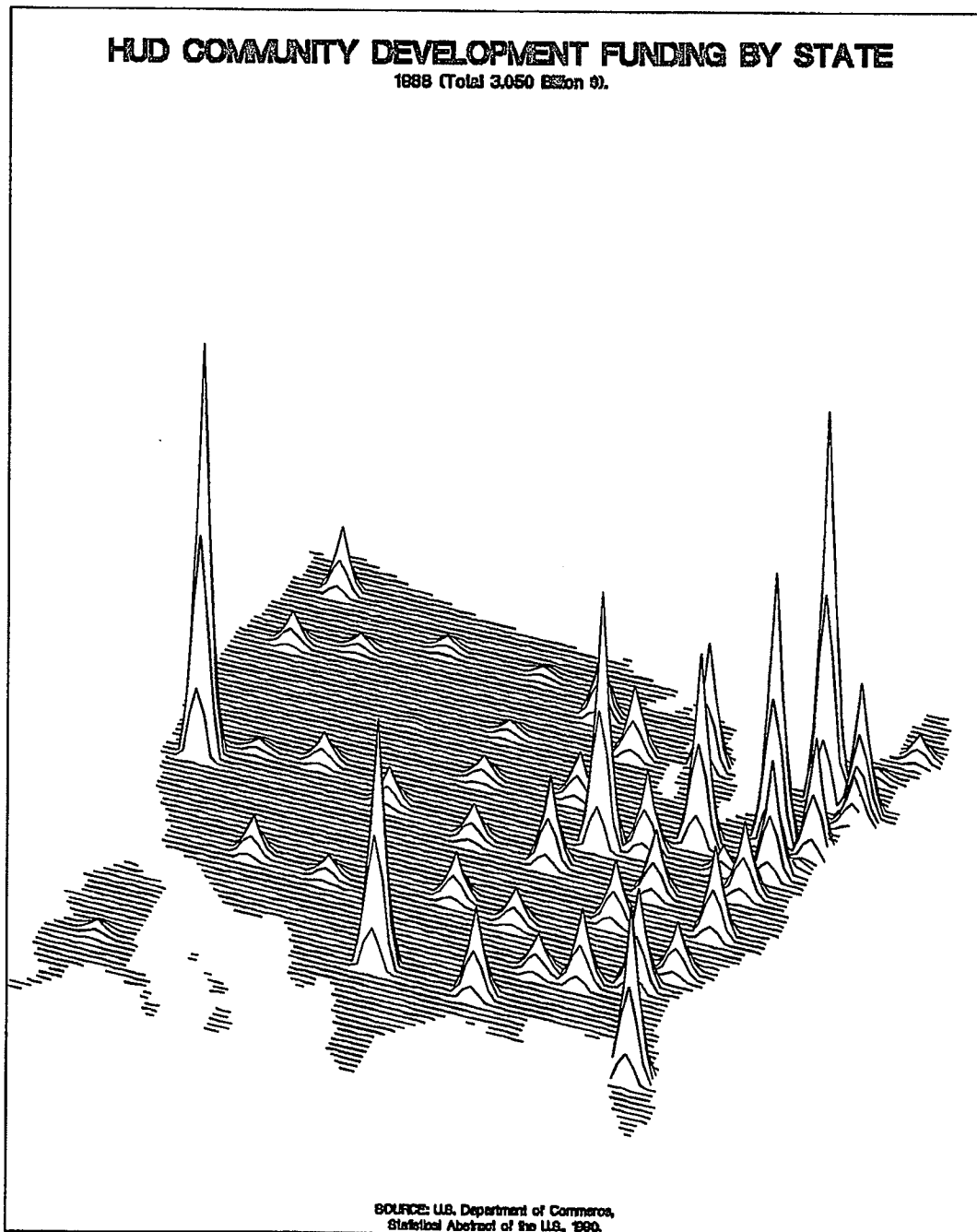




Figure 15. HUD Community Development Funding by State, 1988.



#### 7.4.6 Utopia Made Practical

*The rise and fall and rise of cooperatives and of manufactured housing.*

These items--cooperatives and manufactured housing--have served key niches of the American population. One reflects the sharing of housing consumption, the other the sharing of housing construction. Coop housing was reflected in some of earliest housing legislation, and is boilerplate in each major housing act. Manufactured housing was sustained during the first housing boom following the Second World War, then went bust (Mason, 1982). The mobility of the American population generally militates against cooperative housing, which presumes an almost European cosmopolitan stability of lifestyle. Yet cooperative housing has enough of a constituency to warrant inclusion in several housing acts, pushed as an alternative by non-profit housing groups.

Were it not for the cyclical nature of the housing market, manufactured housing would have more permanence. As it is, it has lived on by penetrating existing construction technologies. As labor-saving housing components have gained acceptance from local regulators and unions, the manufacture of larger and larger components of housing--wall panels, roof gables and rafters, and truss joists--has increased within the lumber and millwork industries, which have built these components as new product lines. Because the home building industry is dominated by small independent contractors who must competitively bid on work, the labor economies of manufactured housing components will continue to penetrate the industry. House factories, thriving in Japan, have more of a rural presence in the United State due to urban unionization. Whether metropolitan house factories can survive is an open question which the market currently answers in the negative.

#### 7.4.7 The Biggest Housing Policies Aren't Housing Policies

*Policies by accident versus policies by design.*

#### 7.4.7.1 Accelerated Depreciation and Rental Housing

The tax treatment of accelerated depreciation and its effect upon the multi-housing boom of the 1970's and bust of the late 1980's has been well documented. Accelerated depreciation for investors in the 1954 Tax Act also increased rental housing investment, a boom cut short by the FHA Section 608 Apartment Building scandal over windfall profits due to "mortgaging out" by developers.

In what has become typical, attention was directed toward a scandal and away from the large-scale effects of tax policy on housing. The response was typically program-oriented as opposed to policy-oriented. The 1956 Housing Act raised ceiling on FHA Section 207 Rental Housing mortgages to 90%, with severe restrictions on windfall profits from "mortgaging out" (Mason, 1982, 65-69). Public housing was cut back in response to voter negativity.

The accelerated depreciation story can be carried forward to account for the multi-housing boom of the 1970's and the bust of the 1980's.

The tax treatment of accelerated depreciation did as much to turn on and turn off the development of multi-unit housing than any housing policy previous or since.

The tax treatment of home ownership will be treated in detail in the next chapter.

#### 7.4.7.2 Effects of 1956 Highway Act.

The inadvertent coincidence with the greatest public works project in human history--the building of the Interstate Highway System--with one of history's greatest migrations--the post World War II migration of rural African Americans to cities--wreaked havoc in cities which saw the relocation of thousands for public housing, for expressways, for educational institutions. Many of these thousands of people set in motion found their way to new suburban home developments, thus benefitting the home building industry tremendously while urban change

accelerated. This convergence of unintended consequences still has not received the historical and quantitative scrutiny it deserves.

#### 7.4.8 The Fourth Power Revisited

*Bureaucracy gains functional independence amid legislative confusion.*

From time to time, the federal housing apparatus has proved capable, with some presidential assistance, of defying Congress. The Housing Act of 1969 included the so-called Brooke Amendment, named after Senator Edward Brooke, which linked increased federal operating subsidies only to those local authorities which limited rents to 25 percent of tenant income (Hays, 1985, 128). HUD's concern about misuse of operating subsidies by local authorities led to the spending of only \$33 million from the appropriated \$75 million in subsidies (Mitchell, 1974, 446). The HUD Cabinet agency had for a time achieved institutional autonomy from Congress as a mature bureaucracy.

#### 7.4.9 Some "Generic" Housing Graphs

Figure 16 displays annual housing construction from 1949 to 1969 taken from U.S. Census (1976, 639-640) historical data.

Figure 17 displays annual housing construction from 1970 to 1988 taken from U.S. Census data.

### 7.5 Housing Policy Stories Claiming Moral and Perceptual Certainty

#### 7.5.1 The "Burden of Race"

*The enduring "color line".*

Despite fifty years of federal executive orders and of civil rights legislation, and despite progress, major cities like Chicago remain substantially racially segregated in terms of housing. Although two out of every three African Americans do not live "below the poverty line," those who do suffer from reduced access to better housing. Professor William Julius Wilson's recent

Figure 16. Annual Housing Construction in the United States, 1945-1969.

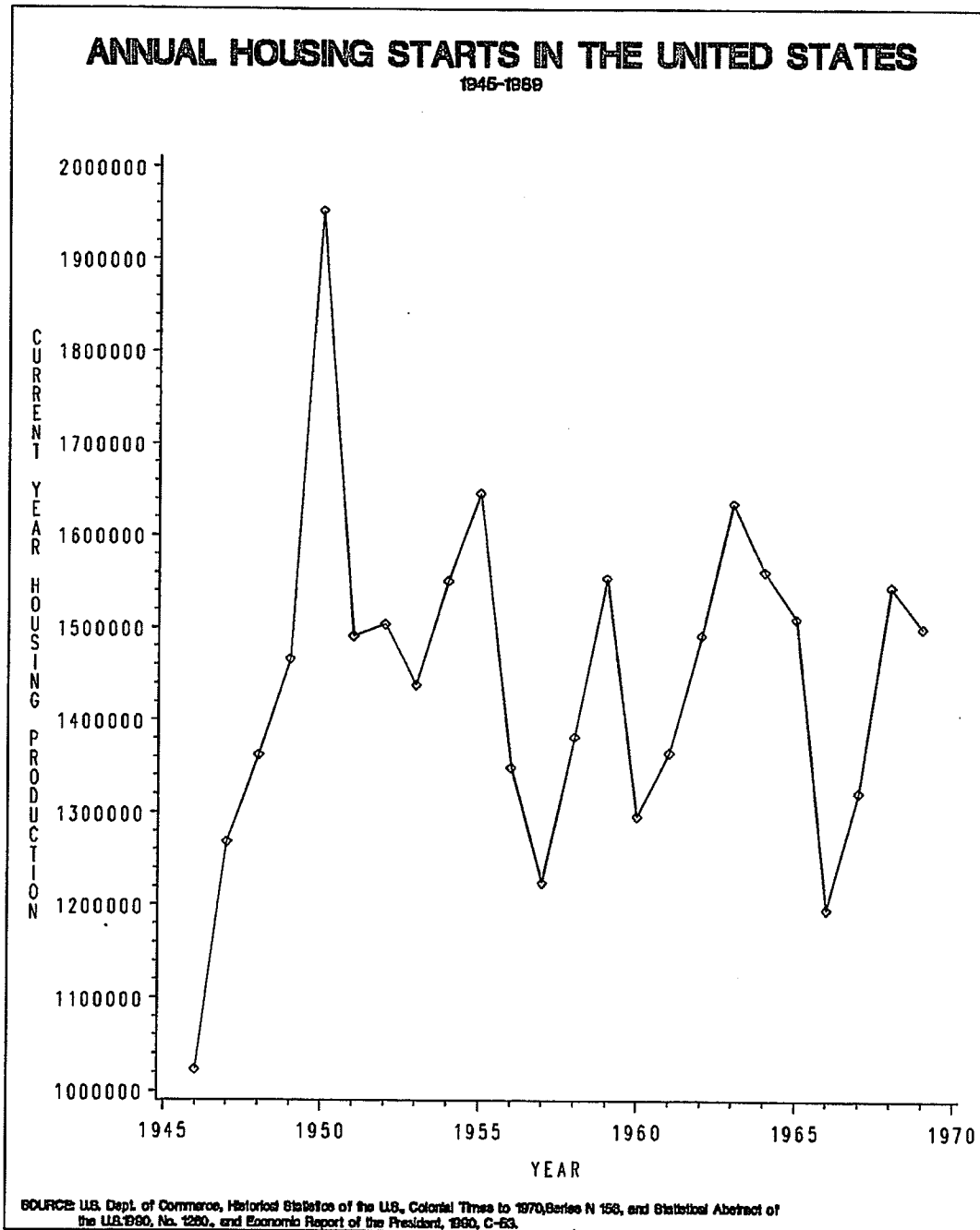
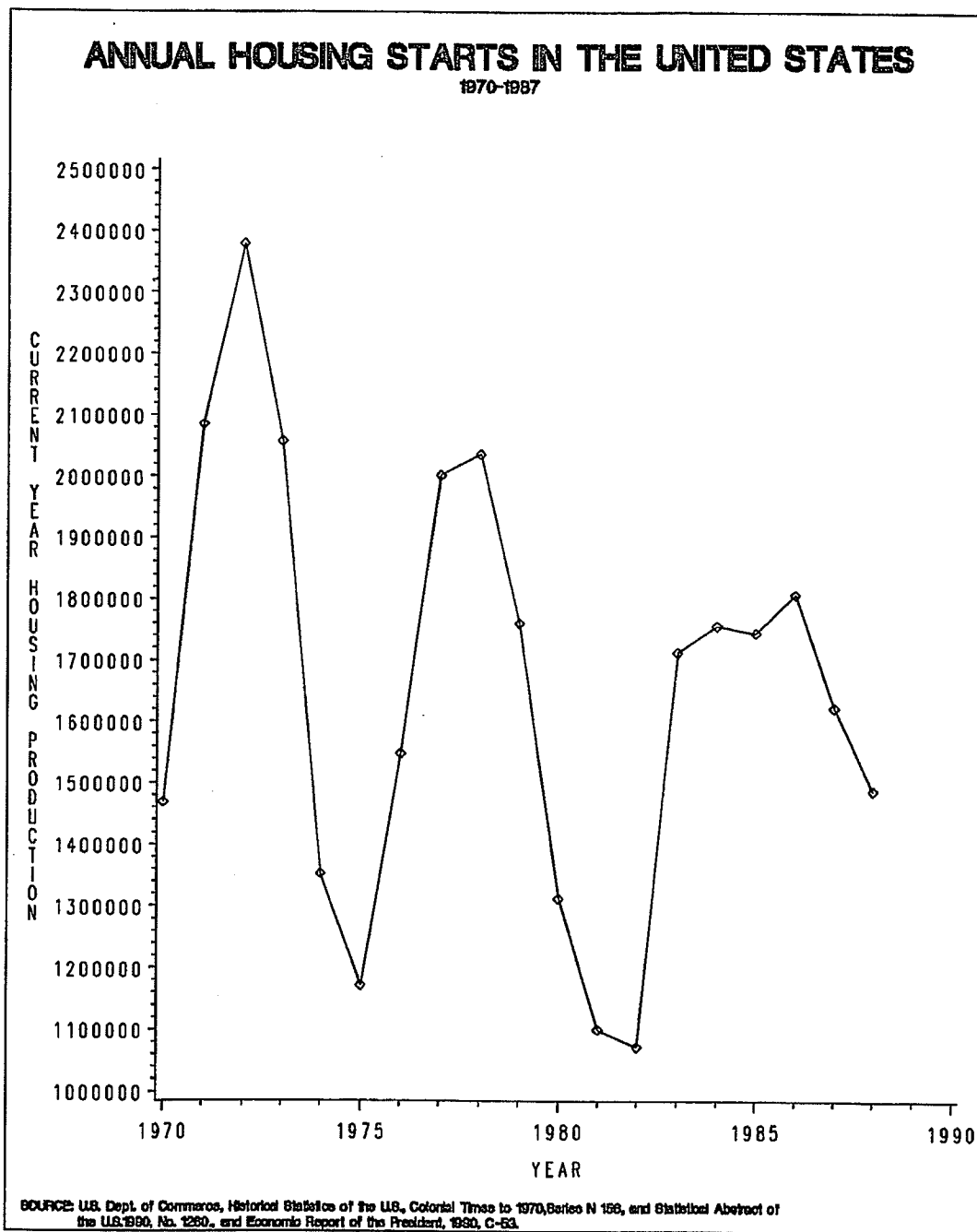


Figure 17. Annual Housing Construction in the United States, 1970-1987.



research interviewing two thousand unemployed Chicagoans paints a pathetic portrait in this regard. This problem cries out for betterment.

#### 7.5.2 Let Housing Policy Be Housing Policy

*The recurring effort to keep federal construction monies focused primarily on housing as opposed to institutional, commercial, and industrial concerns.*

The 1930's and 1940's saw many instances of diversion of housing funds into the general construction area, and especially the disaster relief area--whose definition of disaster continued to broaden. While disaster relief funds gradually moved out of the housing area by the mid-1960's, the Kennedy and Johnson years saw a boom in college dormitory and supporting institutional construction, for which the phenomenon of the fifty-year loan had been introduced in 1955. President Eisenhower had earlier fought a running battle over the expansion of federal spending for these items, pushing for those colleges which had bond authority to fund their own construction. Although his call for a centralized housing and development agency did prevail, his moderation on college housing did not, and construction spending for college construction expanded under Kennedy and Johnson.

FNMA also experienced a period under Johnson when it became a catch-all secondary market mechanism for Great Society debentures, among them Farmers Home Administration, the Office of Education, the Small Business Administration, and the Export Import Bank as well as the FHA, VA, and FNMA instruments previously authorized (Public Law 89-429, May 24, 1966). A few months later the Independent Offices Appropriation Act of 1967 authorized FNMA to issue participations in obligations of which HUD and VA now comprised only 52% of the \$3.23 billion authorized (Public Law 89-555, September 6, 1966). The founding of GNMA in 1968 helped to move FNMA back into the housing arena.

In another instance, the "Public Works" nature of housing and development spending also brought about a situation wherein such spending served many other constituencies besides the recipients of housing--such as the construction industry, labor unions, local political and neighborhood organizations--and these served to drive up the cost of federal housing to the point where three dollars of federal construction money were spent to house those for whom it would cost one such dollar to just "give them the money."

"Just giving them the money" was much too controversial to try without thorough testing. This was done (Friedman and Weinberg, 1983), and, although the results were encouraging in some instances, they served more to convince the scholarly community than political constituencies that some form of direct cash housing aid might work.

### 7.5.3 Bait and Tax

*How recipients and providers of public housing are forced to subsidize themselves, and they sometimes can't. How these self-subsidizers thus pay an indirect tax to maintain policy rhetoric, and how this process is spreading throughout other areas of housing policy.*

Meehan ([1979] 1985) has outlined eloquently how public housing was not capitalized properly from day one, day one in this case being 1949, and how public housing authorities were not allowed to build up proper capital reserves for repairs. In addition, public housing had shaky political support. With great reluctance and half-heartedly did direct federal funding of public housing begin. In proportion to privately-built housing, public housing construction remains less than 2.5 percent of housing activity annually. Only a portion of the units appropriated were ever built, and those built have put stress on local communities, clustering urban public housing in inner cities. While homebuilder and realtor organizations originally jointly opposed public housing the homebuilding industry now supports it. By 1968, housing subsidies for new construction had gained constituencies not only in the Democratic cities and



in the Democratic Congress, but the NAHB and the Mortgage Bankers Association (MBA) had also signed on (Hays, 1985, 108).

But fourteen years earlier, a then unpopular Supreme Court Decision of 1954 allowed municipalities to buy private property, tear down buildings, and sell the property to private buyers. J. Paul Mitchell (1985, 10) reported there were no administrative authorizations from Eisenhower for public housing in 1954. In such a climate, rents rose for tenants, and these households became locked in poverty. Decline of public housing family welfare accompanied the decline of public housing itself.

Even a non-partisan observer as I try to be cannot but be struck by the irony of federal subsidy largesse for numerous housing constituencies on the one hand and the strict and punitive patina of regulation encrusted over the rusty finances reinforcing public housing. Once regulation did not permit the proper capital reserves for repair of public housing, every cry of human misery therefrom became an inexorable footnote.

#### 7.5.4 "Trust the Market or the People?": from Rent Control to Vouchers

*Rent control, while representing a tiny portion of the monies allocated for housing, nevertheless grabs headlines away from other housing debates affecting larger numbers of those in need of housing.*

But for a brief--in federal terms--period, rent control has been a local phenomenon.

Federal rent control began during the Second World War due to the housing shortage. With an immediate constituency, it died a slow death, being passed ultimately to, of all places, the Federal Reserve Board, for final disposition (Executive Order 10373, July 14, 1952). The Fed has since resisted being the political equivalent of a nuclear waste dump. However, it took further administrative action and two additional acts of Congress to put the nails in federal rent control's coffin. The Housing and Rent Act of 1953 removed rent control except in critical

defense areas, which were extended to April 30, 1954 (Public Law 83-23, April 30, 1953). Public law 83-95 of June 30, 1953 was more specific, allowing no extension of federal rent control *per se*.

Federal rent control, however, lived on in federal public housing and housing subsidy programs, which of course set maximum rates of renter contribution and reimbursement and thus effectively regulated rents. Perhaps "effectively" is not the right word here, since some renters of public and publicly supported housing have historically paid 50% or more of their income on rent (Meehan [1979] 1985).

Local rent control, mostly a bicoastal phenomenon, began during the Second World War in the case of Eastern cities like New York and has never ended. West Coast rent control has been a more recent boom-driven phenomenon, and has by far engendered the more spirited debate, with charges of a "Peoples Republic of Santa Monica." Compared, however, to the massive size of federal supports for home ownership, local rent control, whether for good or ill, affects the welfare of a very small portion of the American population.

#### 7.5.5 The Low-Income Shall Inherit the HUD (But Not Yet)

*The tug of war between low-income housing and "low-to-moderate" (read moderate) income housing as the recipient of funds.*

There is an unmistakable "Walrus and Carpenter" aspect to the rhetoric surrounding the 1980's cuts in the HUD budget. "Finally," the rhetoric goes, "we are targeting the housing money where it belongs: to the very-low income dweller." A wag might respond that, yes, now that most of the money has been spent elsewhere. The question still remains, however, "is that targeted money really getting there?" The jury is still out.

#### 7.5.6 Who Really Benefitted From Housing and Urban Development Policy

*Private market and government markets: how fortunes were made with the help of federal dollars, and how market interests shaped federal programs.*

It is difficult to attend developer conferences and not hear at least one senior leader in the industry exhort his or her colleagues, after having spent thirty years enriching him- or herself by using federal subsidies and guarantees as OPM--"Other Peoples' Money"-- to build projects for people who might not be that poor, to look out for those little guys and gals today who need housing assistance. A number of senior developer "lions" undeniably do much good with their current generosity. The question remains, did the wrong people get most of the money?

#### 7.5.7 How to Rent While You Own

*The search for a hybrid form of tenure which is neither owner nor renter but which has all the benefits (but subsequently many disadvantages) of both.*

As housing policy has matured, a strange inversion of sorts has taken place, and to a degree it has begun feeding upon itself by taxing its clients. The promise of "a decent home for all Americans" remains, but the delivery upon this promise takes a combined cultural and economic effort beyond the scope of federal policy to date. So housing policy, reflecting a political process, has multiplied rhetorical efforts to increase home ownership to groups previously targeted for public housing. The most recent Housing Act, worthy of an entire treatise itself, is in some ways the culmination of a housing policy that has run out of substantial options for improvement while still seeking to nurture opportunities for rent-seeking--in the political entrepreneurship sense of the word-- as the appearance if not the goal of altruism is pursued.

The Cranston-Gonzales Housing Act of 1990, perfecting earlier attempts, limits the resale of affordable homes built for low income buyers under Title II programs of the Act to

other low income buyers, and compels, under Title IV programs, a low income buyer to execute a note which effectively "captures" a good portion of whatever "profit" a poor family makes should they sell their home up to the first twenty years after their first occupancy. Were the home owners to sell their property, the Feds can thus "recapture" a major portion of the government subsidy that provided that home.

Congress can't risk the inevitable scandals that will come from comprehensively providing either built shelter or direct housing subsidies to the poor--the alternatives "shelter" and "subsidy" being Henry Aaron's 1972 coinage. Congress has been locked in a deadly embrace over these alternatives for two decades--a wrestling match that I'm now convinced that neither side really wants to win. For, if we had a consistent policy based upon either the Democrat building program or the Republican vouchers, there would still be a rough road and scandals and a public outcry--and ensuing shakeups ending each housing policy campaign. So the "twenty-year" trick, either in single family 1990 Act Title IV "notes" or the multi-unit affordable housing contracts of the Johnson and Nixon Eras, merely passes on to the next generation the difficult choices of where to commit the government to long-term housing policy.

And what we are left with are doomed, contradictory, halfway measures: home ownership that is little of the kind, and big-city public housing that is neither ultimately public nor housing.

Not content to build public housing and undercapitalize it (Meehan, [1979] 1985) we now entice individuals into owning homes, and force them into undercapitalization.

We have nourished the poor with the rhetoric of home ownership and home equity-- true and false--for generations. If we propose to assist them in ownership, they will be most unhappy when they find out the "ownership" they work so hard for is devoid of equity benefits, and there will be a political price to pay--again substantially by another generation--and at quite a discount, with something of a lottery of distribution at that.

No policy, no matter how clever, no law, no matter how lengthy, can alter the fact that common law gives us two principal alternatives regarding our permanent dwellings: owning or renting. Let us build our policies upon the rights and duties of renters and owners, and not upon the futile mongrelization of the two that has left our housing policy doggedly chasing its tail for decades, only increasing the numbers of those homeless who cannot own nor rent.

Just how much owning or renting is ideal for our nation is open to much debate--a debate, it is hoped, that will be honestly joined prior to the next elections. Whatever the outcome, let the resultant renters be really renters, and owners be really owners. Finally, let our government--the political myth of home ownership notwithstanding-- act like the responsible landlord that it is trying not to be.

Not wanting to pan the whole Cranston-Gonzales Housing Act, which does us the service of preventing the highly-leveraged piggy-backing of federal development subsidies, I am searching for the right dosage of vitriol to express how misguided and unfair I think its resale limitations and recapture provisions are. Remove the "N" from "home ownership," and you get "home owership." That's close. But the colloquial expression for half of a donkey, my apologies to the donkey, is just about right. If the law is as Mr. Dickens described it, then half-way policies are at least half as much.

When political rent-seeking becomes part of the housing policy process, and when the housing budget is constrained, then a housing act can tend to become a catalog of symbolic gestures. When the symbols in addition to this contradict one another, much needless human suffering can ensue, since these symbols have the force of law to move people against their wills into situations not completely of their own choosing had other reasonable options been available to them. When people are desperate for housing, they will take any bad deal that comes along. I'm afraid that federal housing policy continues to give the poor a bad deal.

## 7.6 Chapter Summary

This chapter proposed a map of qualitative induction for United States housing policy. The chapter moved initially toward the received arguments of partisan positions within housing policy, away from them, and against them, in the process of constructing an alternative and less partisan history of housing policy. An attempt was made to catalogue key areas of dispute in housing policy, or housing policy stories. A number of these were focused into a polemic. From this polemic two key themes were derived, the metaphor of the "deadly embrace" representing the American housing policy impasse, and the commonsense theme of using policy options rooted in common law adaptations to unintended consequences.

In this qualitative context the Mortgage Interest Deduction will be considered, and then considered quantitatively. To set the stage for this focused inquiry, the Mortgage Interest Deduction's place in tax policy will be observed. The manner in which this inquiry is conducted, however, will follow the "convincing ourselves--convincing others" format, in order to demonstrate the usefulness of the approach of formalized and accumulated common sense.

## Chapter 8

### THE INQUIRY

#### 8.1 How We Will Proceed and Why

This work began with the complex problem of addressing complex public problems, and with dissatisfaction at the received method of "blind" incrementalism which springs from a method of public policy inquiry tied to the "law of the instrument" (Kaplan, 1964). Policy analysis within such a context tends to provide reasonably correct answers for questions surrounding public issues--answers which, however, do not address the complex sense of certainty the public has about these issues, and thus remain unenacted. This work attempts both to examine the issues and to address the complex sense of public certainty surrounding housing policy in general focusing on the Mortgage Interest Deduction in particular.

Heretofore I sought to develop a method which:

1. does not *a priori* close off avenues of research for instrumental reasons which play important parts in the public's complex sense of certainty about an issue which we must address after our scientific reasoning about this issue has been substantially completed;
2. allows us to concentrate both on the forest and the trees without losing either our way in the forest or forgetting that a forest is composed of trees; and
3. addresses as many of the "three certainties"--*perceptual, demonstrative, and especially moral*--as possible.

What I want to come out of this method is both:

- the answers offered by scientific inquiry, and

- a map of how to use them.

In public affairs, we need both.

If you the reader have skipped ahead to this chapter, its structure will confuse you unless I point out that this chapter attempts to bring to the foreground some of the commonsense reasoning processes that planners and policy analysts use to "convince themselves" on a question of policy. These professionals "mull over" many aspects of a given problem over a course of time that varies from minutes to decades. During this process of "mulling over," whatever short cuts to inquiry and judgment that a planner or policy analyst has learned over the years come into play. What I do in this chapter is situate some of the typical questions raised in scientific analysis within the framework of my own commonsense short cuts. This helps me to demonstrate how policy analysts and planners "convince ourselves" through a marriage of scientific and commonsense reasoning.

This chapter looks specifically at the question of the mortgage interest deduction in the United States. Should it be further limited? What would be the effects if it were? These questions will be considered, but the focus of the inquiry will remain only on those policy options which stand some chance of passage, and these are few.

The public sector is known for its redundancy, and inquiry into public affairs is no different. To shave away questions until answers remain requires not one razor, but two. The first is the familiar sharp razor of Occam about parsimony of scientific argument--*essentia non sunt multiplicanda praeter necessitatem*. The second is the worn, scratchy blade wielded by the commonweal--will the citizens like it, will Congress pass it, the President sign it, and the Courts uphold it?

This second razor recalls Aquinas' definition of politics as the art of the possible. It also recalls Herbert Simon's (1982, 476) acknowledgement that decision theory must "handle" both



the microscopic and macroscopic, from individual choice to political economy. The commonsense boundaries of politics are not parsimonious. Nevertheless we must first attempt to determine where these boundaries are. Then we can prune away the impractical with our second razor as we prune away the improbable with our first.

We have selected one huge tree from our policy forest, the Mortgage Interest Deduction. First, we will examine this tree in its complexity, and then, using our two razors, we will hone it down.

Since this question is a "big" one potentially affecting millions of citizens and many submarkets, I situate scientific inquiry into the framework of common sense by casting the inquiry into my "just war theory of economics" schema, which was developed in the earlier chapter on "Refuting Common Sense":

1. What's so harmful about it now?
2. What means should be used to reduce it?
3. Have all other means been attempted?
4. Is our remedy proportionate to the problems caused by the MID?
5. Will we be better off afterward?

This structure is used to first "convince ourselves" by an attempt to get a "wider view" of the problem, and I choose this method due to the limited resources available to an analyst working alone. "Wider" views in housing studies have already been attempted. Housing analysts recall the design of the Experimental Housing Allowance Project (EHAP) experiment (Lowry, 1983) which also attempted a "wider view" by separating the study into a "supply," a "demand," and an "agency" component. Writing of such large-scale government evaluation studies, Richard Nathan (1988) has ruefully remarked that there is no surer way to kill a public experiment than to study it under government auspices. I have attempted to avoid the pitfall of politicizing the issue studied while still maintaining a many-faceted approach.

In order to avoid politicizing the issue in the following inquiry, it is important to discuss the current state of propaganda about the Mortgage Interest Deduction, and its place amidst other homeowner tax preferences.

## 8.2 Ideological Context of the Mortgage Interest Deduction

The deductibility of interest paid on mortgages, and, indeed, on almost every form of loan, has been one of the more tempting to change in terms of increasing government revenue. It had been proposed and voted down several times over the years. With the 1987 Omnibus Budget Reconciliation Act (OBRA), it has been a temptation enacted.

Despite the fact that the Treasury Department recommended the elimination of all deductions for state and local taxes, and President Reagan floated the idea early in 1984 (NAR, 1988) the President promised on Friday, May 11, 1984 (Chicago Tribune, 5/12/84) that no reduction would be made in the homeowners' tax subsidy. And, while Congress considered the matter long and hard in the preparation of the 1986 Act, only the principle of changing the deduction was established with the 1987 OBRA. OBRA limited, effective 12/31/87, the amount of total mortgage interest to \$1 million aggregate acquisition indebtedness for as many as two residences (Pannell et al., 1988), with an additional \$100,000 in principal secured by real estate allowed for other borrowing. While "capping" total deductible mortgage interest at \$1.1 million dollars principal, the 1987 OBRA left the deduction for local real estate taxes untouched. Proposals to further limit the MID, especially for home equity loans or second mortgages, might again come up for further discussion during the 102rd Congress.

The kind of passions such proposed changes engender illustrate some of the policy considerations.

Writing in the *Christian Science Monitor* on March 23, 1988, Sara L. Smith, an homeowner, assailed the inequity of the tax advantage given homeowners over renters. She

contended that the deduction benefits primarily lenders, the real estate industry, and government, while she acknowledged she liked the idea of paying less taxes. Smith also maintained that an unintentional effect of the homeowners' deduction was that "In such yuppie Utopias as Fairfax County, Va., singles with six-figure incomes rattle around in four-bedroom, three-bath tax shelters while the police, schoolteachers, and others who service the county must commute 20, 40, even 60 miles one way if they want to buy a house they can afford."

Ms. Smith then suggested that if the cancellation of the deduction for mortgage interest were enacted in tandem with an increase of the personal exemption to \$3,000.00, thrift and savings would be encouraged among present and prospective homeowners, more loans would be repaid early, lenders would have less paperwork, larger down payments would be required, and a small, permanent reduction in building activity would ensue, thus limiting overbuilding (Smith, 1988). A similar proposal, but with a suggestion of the replacement of the MID with a tax credit in order to achieve goals including reduction of migration from city to suburb can be found in Greeley (1977, 144).

The National Association of Realtors (NAR), as you might imagine, took a different view. In a February 1, 1988 editorial entitled, "Mortgage interest deduction foes cheer", *Realtor News*, the organ of the NAR, defended the Mortgage Interest Deduction for supporting homeownership, and railed against the 1987 Omnibus Budget Reconciliation Act (OBRA) cap of \$1,000,000.00 mortgage principal for deductible interest. Calling the *Washington Post* "one of the ardent proponents of restricting mortgage interest deductibility," the NAR feared the *Post's* following statement: ". . . the bite was less important than the principle this time around. First you establish that there ought to be a limit; then you can argue about where."

The NAR estimated that the 1987 OBRA would bring the U. S. Treasury a scant \$8 million, and estimated that about \$28 billion in mortgage interest was sheltered per year by the

homeowner's deduction, which might be returned to the Treasury and cut the deficit. Because the NAR views such a change potentially devastating to homeowners and the real estate industry, it affirmed its commitment to fight any changes in the Mortgage Interest Deduction cap "to the point where millions of homeowners would be affected" (NAR, 1988).

Milton Friedman, in a *Forbes* interview (Saunders, 1989, 121) took a view on the MID which prompted Chief HUD economist Susan E. Woodward (1989) to enter the fray with an op-ed piece in the *Wall Street Journal* denying Friedman's position, in her paraphrase, that the Mortgage Interest Deduction "drives a wedge between the cost of owning and the cost of renting." Woodward responded that the Mortgage Interest Deduction does no such thing, and is actually an egalitarian instrument which distributes taxation over a lifetime, and maximizes lifetime taxation by taxing those who are most capable of paying when they are indeed capable of paying. Interestingly, Woodward made no claims about the MID producing a high rate of home ownership, as the NAHB had done previously.

International attention has focused on the MID as a key component of the U.S. Federal deficit. On March 28, 1990, National Public Radio reported that the Japanese trade negotiators suggested specifically to the U.S. negotiating team that the MID be reduced significantly.

The old alliance of combined support from builders, lenders, and local governments for the Mortgage Interest Deduction as of 1988 showed signs of wearing thin. The Government Affairs Division of the NAHB reported very recently (Bannister, 1988, 2) that a leading housing financier would trade the Mortgage Interest Deduction "in a minute" to bail out troubled thrifts. The U.S. League of Cities, in September 1988 testimony before the Senate Banking Committee, called for putting the Mortgage Interest Deduction reduction on the table as a way of increasing low-income housing (NAHB, 1988, 3).

### 8.3 Structural Context of the Mortgage Interest Deduction

Because of the interlocking effects of homeowner tax preferences and the several concerted constituencies in favor of most of these preferences, some short mention of other homeowner tax preferences will weave through this section's narrative until we can isolate the Mortgage Interest Deduction.

Long before the federal, state, and local governments of the United States made formal housing policy, housing was taxed under a general property tax levied by predominantly local governments, which by the end of the nineteenth century evolved into a tax on real estate and business personalty (Musgrave and Musgrave, 1984, 465). Subsequent to the granting of tax exemption to thrifts in 1894, federal participation in the U.S. housing market, albeit passive and unsystematic, accompanied the 1913 Tax Act's establishment of the deductibility of interest and of local taxes. ever since tax advantages of homeownership were established, the efficiency and equity of these tax breaks have been debated (Musgrave and Musgrave, 1984, 346; Downs, 1983).

A number of tax preferences for individual homeowners exist in the current federal tax law, among them the deductibility of mortgage interest, the deductibility of local taxes, the exclusion of net imputed rental income from tax, the deferral of capital gains on home sales, and the one-time exclusion of \$125,000 of capital gains for taxpayers 55 or over. The deductibility of interest and taxes date from the 1913 Tax Act. The taxation of imputed rental income for homeowners, while actually taxed in Germany and in more than one third of the 115 countries with a national income tax in the mid-1970's (Hall, 1987, 46; Merz, 1977), and until 1963 in England (CBO, 1981, 19), has only existed in the U.S. between 1911 and 1917 in Wisconsin, although an extensive literature on the subject exists and it is a perennial dissertation topic, most recently Walsh (1987), who took up the question with an applied equilibrium study.

Pechman (1987, 99) would offset the imputed rental income of homeownership with the deduction for the payment of property taxes and mortgage interest, and eliminate the homeowner's deduction to the extent that the deduction exceeded the imputed rental income. Richard A. and Peggy B. Musgrave (1984, 347) also analyzed the question of imputed rent income for homeowners and concluded that, "However strong the case for inclusion of imputed rent may be in principle, it is politically unpopular and not in the cards." Considering the flurry and acrimony already involved in local property assessments, the chances of fairly administering any system of imputed rent offset or taxation is remote, even if imputed rent were calculated directly from the property tax. Property tax assessments would have to be upgraded and standardized nationally. Walsh (1987, 48) put it succinctly, "Policy makers who instigate such reforms will not be in office when the benefits arrive."

The deferral of capital gains dates from 1951 (note that this was also the year that the tax exemption for thrifts was rescinded), and the one-time capital gains exclusion was legislated in 1964 at \$20,000, raised to \$35,000 in 1976, to \$100,000 in 1978, and to \$125,000 in 1981 (CBO, 1981, 16).

While the emphasis of this thesis is the deduction for mortgage interest, it is important to consider that from the mortgagor's point of view, the money for interest and taxes is paid directly to the mortgagee, the lender, included in one monthly mortgage check. The lender, in many cases, collects monthly increments of the local real estate tax bill within the monthly "mortgage" payment, and forwards this tax money to local taxing bodies at the required times.

A natural constituency in favor of the homeowner's deductions formed among lenders, builders, realtors, and local governments, each of which stood to benefit from the joint deductibility of mortgage interest and local taxes. The Mortgage Interest Deduction, being the greater of the deductions for property tax or mortgage interest, has been said to have

encouraged homeownership, and played no small ideological and financial part in establishing and maintaining the tax base of local communities. As homeownership increased, so did local governments' dependence on deriving tax benefits from the values created by housing.

The federal homeowner's deduction for local property tax also functions as something of a shield for local taxing bodies, which according to Browning and Browning (1983, 454), derive three quarters of their local revenues from the property tax. The Musgraves (1984, 347 fn.) addressed the question of "Whether-- from the point of view of the tax structure as a whole--preferential treatment of housing under the income tax might be considered an offset to the extra burden imposed on housing under the property tax, provided that its proceeds are used to finance general (rather than housing-oriented) expenditures. This is a key equity question: the tax burden upon citizens must be considered as a whole--federal, state, and local--before supposing to answer the question of the fairness of the tax burden on one segment of the population or another.

Since it is generally considered political suicide for a politician to raise taxes, but elected governments must also levy sufficient taxes to fund government, the homeowner's tax deduction has also assisted local governments in obscuring for the taxpayer the total cost to the taxpayer of local taxes. Confronted with the shifting shells of local tax districts and municipal bodies which budget, counties which levy taxes on property they assess under sometimes varying criteria, states which equalize their rates and in some cases standardize assessments, and a federal government which on first glance seems to mitigate the force of local taxes, the taxpayer has no clear idea of who raised taxes when taxes are raised. This legerdemain allows officials on one level of government to pass the blame for taxes onto the officials in another level of government, and allows each elected official the privilege of establishing a voting or speaking record against taxes while the tax base is maintained. This

privilege will not disappear without a tremendous fight, and, when coupled with potential local revenue losses if the local tax deduction were reduced, makes the prospects of a change in the deduction for local taxes very remote indeed.

Moreover, the states themselves have already tried other alternatives for tax relief for the property tax. Earlier in this century a number of states experimented with offsetting property tax with a state income tax deduction. Herbert Simpson, reporting to Herbert Hoover's President's Conference on Home Building and Home Ownership in December, 1931 (Gries and Ford, 1932, 121) examined a partial offset of property tax as a deduction under a state income tax with a sample of 5,086 taxpayers from Dane County, Wisconsin. He concluded that, from the point of view of a state income tax, "an income tax is designed not so much to reduce the burden of the property tax, as to reduce the burden of the property tax upon those less able to pay. This object is best achieved by a straight income tax without offsets" (Gries and Ford, 1932, 122). Simpson presumed that a state income tax would be used to reduce property tax assessments statewide, but noted that a majority of the states (Wisconsin, Missouri, North Dakota, New Mexico, and Georgia) which used such an offset repealed it, and Washington State's was found unconstitutional.

Some economic theorists see a property tax as being the least damaging to the economy as a whole: "The best tax is one that taxes an activity that would have gone forth anyway and thus is paid out of the surplus of either the producer or the consumer, without changing the market's allocation of resources" (Gramlich, 1981, 24). "As land is inelastic in supply and immobile, there is no escaping the tax. Burden distribution will tend to be progressive" (Musgrave and Musgrave, 1984, 473). Other treatments of these questions are Lee Friedman (1984, 401), Henry Aaron (1974, 1975), and Peter M. Mieszkowski (1972). On the other hand, retired citizens on fixed incomes are especially vulnerable to losses in welfare due to rising real estate taxes.



Parenthetically, it is possible to put another interpretation on the taxing policies of the New Federalism. Wealth fled into single family dwellings in the 1970's, and the value of these homes increased beyond the rate of inflation. The shifting of the tax burden back to local governments in the 1980's has the effect of "capturing" this untapped wealth, in a sense taxing the capital gains from the real estate inflation of the 1970's.

The values created by housing create an interesting paradox for government. Real property, because it is stationary, is the easiest thing to tax. Because real property is where people live, it is also a most unpopular thing to tax. As the homeowner's tax deduction helped to increase the number of homeowners, so also did the increasing number of homeowners prevent changes in the tax advantages to homeownership.

To an extent, and in a similar fashion to the deduction for local taxes, the deduction for mortgage interest subsidizes the lending industry as one vestige of the original tax exemption for thrifts, obscuring for the homeowner the real cost of mortgage interest. The thrifts, while powerful in the earlier days of federal housing policy, are in their present weakened condition powerful as a debtor's cartel.

#### 8.4 Integrating Ideology and Structure: The Deduction's Pros and Cons

The following listing of "disputed questions" about the MID:

- allows us to avoid being "blind-sided" by unexpected policy shifts in public attention, and
- to place each of these in a context from which we draw to the foreground those around which policy action alternatives depend, easing the final process of policy winnowing.

##### 8.4.1 Congressional Review of the Mortgage Interest Deduction.

At almost every pivotal year for federal housing policy, most recently 1974, 1981, and 1986, the homeowner's "preference" or tax deduction was evaluated by Congress or HUD (Aaron, 1970; HUD, 1974, 1976; CBO, 1981). In 1976, the Senate came 11 votes shy of passing a reduction of the Mortgage Interest Deduction (Bannister, 1988, 2).

In September of 1981 the Congressional Budget Office (CBO) published a review of the tax treatment of homeownership which dealt with a number of housing and taxation issues including the Mortgage Interest Tax Deduction. The principal author of the review, Joshua E. Greene (CBO, 1981, 6), could find no explicit rationale for the 1913 deductibility of interest beyond committee reports and floor debates which "suggest that interest payments were viewed as reductions in income that should be taken into account in determining a person's ability to pay income tax." It was Greene's impression that legislators were more concerned about business interest at the time than homeowner mortgage interest which at the time was "far less prevalent than today."

From the CBO 1981 study can be drawn two general points:

1. that the tax benefits of homeownership tend to benefit the more wealthy along with younger families; and,
2. that these benefits do increase the rate of homeownership over what it would have been without the tax benefits.

Further economic consequences of the tax preferences for homeownership drawn from the literature by Greene were:

- a decrease in business investment by increasing the attractiveness of homeownership as an alternative means of savings;
- a weakening of the rental housing market by lowering the cost of ownership;
- an unnecessary raising of the price of housing, especially during times of inflation, when homeownership outdistances other investments;
- and a driving of the marginal tax rates higher in order to raise necessary revenue (CBO, 1981, 27-28).

Greene (CBO, 1981, 11) also noted that the HUD Annual Housing Survey found in 1978 that less than 40% of all U.S. homeowners claimed the Mortgage Interest Deduction, and only 62% of those with mortgages took the deduction, while only 31% of those earning an adjusted gross income of \$15,000 or less took the deduction.

CBO estimated the effects of ceilings on the deductibility of mortgage interest and the effects of the elimination of the deduction. A full elimination of the deduction would have affected 23.5% of all income tax returns, or 70% of itemizers, totalling 22 million taxpayers, adding \$17.6 billion to federal revenues for a projected year 1982 (CBO, 1981, 44). He concluded that a limit to the deductibility of mortgage interest would:

- increase the attractiveness of renting and free consumer savings for alternative investments to housing;
- that high bracket homeowners would see a reduction in their home values, while homes which fully qualified for deductions would increase in value;
- that rental quality would increase while new home construction would fall,
- that only 1.5% of those with 1981 incomes of \$30,000 or less would experience a tax increase under a \$5,000 ceiling in mortgage interest deductibility,
- while the Treasury would gain \$3 billion in 1982.

Policy variants discussed by CBO included tying the deductibility ceiling to the size of the mortgage, placing a cap on deductibility based on, for example, the first \$50,000 in mortgage balance, establishing an artificially high ceiling which would draw few protests and then sitting back and allowing that ceiling to take more and more effect as inflation continues, establishing a gradually falling cap, and grandfathering current owners (CBO, 1981, 46-49).

It should be noted that shortly after the publication of CBO's *Tax Treatment of Homeownership*, the U.S. Senate voted 83-0 against limiting the Mortgage Interest Deduction.

"This shows the lack of political support for such limitations, at least during a congressional election year" (Downs, 1983, 169). It can also show that the Mortgage Interest Deduction's constituency, "tipped off" as it were by the CBO study of a possible policy change, was able to not only anticipate the policy change but smite it, showing that Rational Expectations not only extends to demand side behavior, but to supply side.

The House passed in its Tax Reform Act Technical Corrections Bill in August of 1988 a provision to recapture the mortgage revenue bond subsidy. Upon sale of a home, a portion of the gain would be paid to the U.S. Treasury. Since the 1986 Tax Reform Act included a requirement that the amount of proceeds of a home sale be reported to the IRS (with a form now called 1099B), it was not long before the idea of collecting federal tax at the closing of a home sale be proposed. "A member of the Ways and Means Committee has suggested that this could be the way that Congress will get to the interest deduction, i.e., upon sale the accumulated deduction would be paid back to the Treasury out of the equity gain" (NAHB, 1988, 3). To date, such an option has not been further considered.

#### 8.4.2 Downs's Position on the MID.

In his recent book on rental housing, Anthony Downs (1983) examined a number of policy options that might increase the supply of such housing, which he maintained would rise in price yet drop in supply throughout the decade. Downs supported the modification of present homeownership tax benefits. He stated that the present practice of deducting mortgage interest and property taxes from taxable income produced "huge benefits received mainly by high bracket households."

Downs recommended replacing deductibility with a tax credit and reducing the credit on the average by about 14 percent in order to achieve the following goals:

- The tax system would still encourage home ownership.

- "The benefits would be distributed more fairly. Each dollar of interest or property taxes paid would produce the same tax savings for every household, regardless of income, instead of aiding wealthy households disproportionately."
- "The federal funds saved by reducing these overall benefits about 14 percent would pay for a nationwide housing allowance entitlement program covering all renting households with income below 50 percent of their areawide medians. This would greatly improve the overall fairness of present housing subsidies and tax benefits."

The sheer size of the subsidy, over \$30 billion in 1981 (\$21.5 billion for mortgage interest, \$9.5 billion for property tax (Downs, 1983, 169)), made it a prime deficit cutting target. Hays (1985, 64) pointed out that the subsidy of \$32.6 billion of 1981 according to Palmer and Sawhill (1982, 402) amounted to approximately five times the amount paid in housing subsidies to the poor. The CBO estimated that the mortgage interest portion of the subsidy would approach \$56.5 billion in 1986 (CBO, 1981, 7).

#### 8.4.3 Pechman's Position on the MID.

Prior to his recent death, the Brookings Institution's Joseph A. Pechman (1987, 94) questioned whether the homeowner's deduction is warranted, since homeowners are, in effect, also not taxed on the imputed income representing the rental value of their homes. In addition Pechman maintained that homeowners, because of the size of their homeowner's deduction, can easily itemize any other deductions, whereas renters are more often constrained to the boundaries of the standard deduction. New, non-housing deductions are thus more likely to be fully exercised by homeowners, whereas renters must sacrifice their standard deduction in order to do so. Pechman (1987, 153) later mentioned that recent studies showed that tax benefits of homeownership might have siphoned off savings which could have gone into plant and equipment during the inflation of the 1970's.

While Pechman and others question the equity of the homeowners deduction as an unfair advantage of homeowners versus renters in federal tax payment, it is not clear whether, on the local level, the homeowner does not bear a correspondingly disproportionate share of the burden of local taxes. The CBO, (1981, 13) while holding the jury still out on the question, proposed that higher taxes for rental property might be reflected in lower property values and not be completely passed through to renters.

#### 8.4.4 Poterba on Housing and Tax Reform.

James Poterba (1987), in a working paper for the Joint Center for Housing Studies, took a look at the anticipated effects of the 1987 OBRA on housing. By reducing marginal tax rates, Poterba felt the federal government had reduced the value of other homeowner tax preferences. By raising the effective tax burden on corporations, after-tax return is reduced. In Poterba's system, as shall be seen below, the opportunity cost of residential property investment is affected by this after-tax corporate rate of return. If interest rates are affected by OBRA, Poterba predicted a possible increase in residential investment. Poterba's model depends on several assumptions as to who is producing housing and that their tax is unavoidable. S-Corporation elections by C-Corporations to avoid corporate tax rates are not considered by Poterba in his Joint Center paper, although S-Corporations, in which owners are taxed as partners at individual tax rates, make up a sizable proportion of smaller builders.

Poterba commented elsewhere that given constant 10 percent inflation and a 25 percent marginal tax rate:

eliminating mortgage interest deductibility would change user cost from 4 percent to 7 percent, leading to an immediate fall of 26 percent in real house prices. . . . The fact that changes in the tax law will have important effects on the relative value of different household portfolio assets is often ignored in policy debates. Removing mortgage interest deductibility, if it reduced real prices by 26 percent, would imply a net wealth decline of 545 billion 1980 dollars for the household sector. This is 13 percent of household net worth, and the most substantial effects would probably be upon highly levered

homeowners for whom a sharp decline in real house prices could lead to severe financial distress. (Poterba, 1984, 748)

Inflation, interacting with the tax system, increased the tax subsidy of the interest deduction to have a greater effect than not taxing homeowner imputed rental income. Poterba stressed the substantial interaction of inflation with the tax system upon housing, and concluded that this interaction could explain "most of the 30 percent increase in real structures prices during the 1970's."

#### 8.4.5 Andreassi and MacRae's Simulation of MID Reduction.

Michael Andreassi and C. Duncan MacRae (1981) prepared a study using the Urban Institute Housing Model which simulated the ten-year effects of an elimination of housing deductions. They projected a "significant decrease in the quantity of housing consumed, an increase in prices for lower-income groups, a shift in the distribution of taxes paid by income and tenure, and a drastic cutback in new construction activity." Andreassi and MacRae also predicted a rise in tax for upper-income households, a significant decline in taxes for the middle-to-lower-income groups, in a range from 19% to 36%. It must be noted that their model assumed an across the board reduction in marginal tax rates along with the elimination of the homeowner's deductions. In such a policy change the lowest income households received a 36% tax decrease and the middle-income households received a 6% decrease. Note that Andreassi and MacRae's assumptions do not have access to CBO's (1981) information on what percentage of homeowners currently take advantage of the homeowner's deductions.

#### 8.4.6 Pierce Hall on Equity and Homeowner Tax Preferences.

In what ranks with CBO (1981) as the most thoroughgoing analysis of the legislative and tax aspects of homeowner preferences to date, Bethane Jo Pierce Hall (1987) studied the equity and revenue effects of the elimination or reduction of tax advantages for the homeowner

in her recent dissertation in the field of tax accounting. While not addressing directly policy interactions, Pierce Hall used the 86,277 observation Internal Revenue Service Individual Tax Model File for filing year 1982, and simulated the effects of policy changes in homeowner preferences from the point of view of equitable distribution of the tax burden. Pierce Hall (1987, 212) found that limitation, not elimination, of the deductions for mortgage interest and local property tax were optimal in terms of horizontal and vertical equity and revenue impacts. She did not take up questions of the effects on housing or lending markets of such limitations, but she agreed with Follain and Hendershott (1986, 14) that tax policy was a most expensive and inefficient means to increase rental housing, preferring instead vouchers or income transfers to achieve such ends.

Bethane Jo Pierce Hall's (1987, 195) approach provides a useful refutation of akratic possibilities, since the survey-simulation method does not assume away market irrationalities, but "captures" them in the analysis.

#### 8.4.7 Congressional Budget Office and MID.

Each year as part of its Annual Budget and Economic Report, the CBO returns to the questions posed in the 1981 CBO study. The CBO, in its February 1990 Report, the CBO proposed three possible limitations for the Mortgage Interest Deduction:

1. a limitation of the deduction to 15% of the interest paid, thus netting the Treasury \$52.9 billion over five years;
2. A \$12,000 individual and \$20,000 joint return cap on mortgage interest deductions, with a Treasury \$8.2 billion five year net; and
3. a second home deduction phase out, with a five year Treasury net of \$1.3 billion (CBO, 1990b).



The CBO typically presents a range of options to Congressional panelists, of which at least one has no chance of passage, but which provides a useful contrast with the others.

#### 8.4.8 Summary of Controversies on the MID

Following my method of formalizing and accumulating common sense, I list the controversies surrounding the Mortgage Interest Deduction, a number of which for now we will treat as open questions, or "commonsense propositions" weaved together into stories by contending partisans in the MID debate:

1. The MID decreases business investment.
2. The MID decreases rental housing investment and quality.
3. The MID aids at-home tourism and rural development by boosting the vacation home market.
4. The MID raises the price of housing unnecessarily.
5. The MID drives marginal tax rates higher.
6. The MID, in tandem with elimination of other interest deductibility, has increased home equity lending, thus draining American capital into consumer spending as opposed into capital development.
7. The MID allows more homeowners to itemize deductions than renters.
8. The MID benefits primarily the rich.
9. The MID increases new construction.
10. The MID increases the homeownership rate.
11. The MID encourages overconsumption of single-family housing.
12. The MID distributes taxation over a lifetime.

Let us consider each of these controversies in turn.

#### 8.4.9 What to Watch for as We Consider

The following arguments have the unusual structure of making explicit what is often implicit in public inquiry. They are offered, following my earlier metaphor of the musician who can hear both the background and foreground music, to demonstrate the hidden thought which links items as one analyst searches down the paths of public inquiry. I thus here make explicit how I reason to convince myself, prior to my attempting to convince others. This reasoning is made explicit in order to demonstrate how the method of formalized and accumulated common sense works. Usually, for reasons of economy of research, these reasonings would not be made explicit in the final presentation.

#### 8.5 Conflicting Mortgage Deduction Stories--What's Wrong with It Now?

##### 8.5.1 Does the MID Decrease Business Investment?

De Leeuw and Ozanne (1979) took up this question at the height of the inflationary 1970's, and concluded that indeed, in the presence of inflation, the MID diverted capital away from plant and equipment and put it into home ownership. This finding was also supported by the CBO (1981).

##### 8.5.2 Does the MID Decrease Rental Housing Investment and Quality?

The 1981 CBO study agreed with this criticism of the MID. But the question, not a settled one, nicely allows us to consider one of the Know-Do Matrix Boxes, the Chaos Box.

One way of considering the question before us is to look at housing cycles for both single-family and multi-family housing. From this exercise we gain important information:

- Assuming historical Census figures are relatively accurate, there seems to have been a strong relationship between single and multifamily investment which ended during the time of the New Deal legislation.
- Chaos graphs allow us to look at "policy epochs" of housing policy.

- Proving definitively actual existence of mathematical chaos in housing markets is beyond our present capacity due to restrictions in the Census data.
- We "abduct" that, if the MID took greater effect after WWII, as Marc Weiss suggested, then tax depreciation laws allowed rental housing to temporarily keep pace with single family housing production. Most inconveniently, the single versus multiple unit housing figures from Census data are not reliable for the years 1945-1958, and we cannot verify this quantitatively.
- In the present "policy epoch," the absence of favorable depreciation schedules have created a dearth of multiple housing, thus giving some strength to the argument that, without favorable depreciation, multiple housing will lag far behind single family development.
- This raises a further question, has the expectation that the government might allow more favorable multi-housing depreciation at some time in the future created a "pent-up supply"?
- We "abduct" that, because of international pressure upon the United States budget deficit, there will be no depreciation incentive for rental housing in the foreseeable future.
- We thus hold (this is the right word, for it is not proven) that, with a tax incentive continuing for home ownership without one continuing for rental development, that the supply of rental housing will not keep pace with that of single family housing. Thus a gap between owning and renting will worsen.

#### 8.5.2.1 A Look at Chaos in Housing Cycles

In this particular application we first examine the question of chaos in housing markets. What we find is suggestive, but we cannot measure accurately due to the state of development of the quantitative tools. We do, however, abduct our way to a hypothesis about "eras"

bounded by policy shocks. We then consider the possibility of rational expectations interactions within the eras.

#### 8.5.2.2 Is There Chaos in Housing Markets?

Both the National Association of Homebuilders (NAHB, 1991) and the National Association of Realtors survey their memberships to assist in the prediction of housing activity. Without such surveys of building industry actors, it would be very difficult to accurately predict housing markets at all. Yet in periods of economic turbulence even such surveys cannot predict accurately beyond the next period.

Demographic models, for example, predicting family formation among baby boomers have helped refine housing forecasts, but, like the recent drop in some Ivy League college applications, a sudden change can appear as it were out of the blue.

That housing markets are interest-rate sensitive is axiomatic. But interest rates themselves are not accurately predictable over a several year period. Builders, with knowledge in their "gut" about household formation, land scarcity, future development, and other factors unique to their market area, will build "for spec", or speculate, even in the absence of favorable interest rates, based upon their expectation that interest rates cannot stay high forever, and that enough people will take a chance and buy. But if high interest rates persist, the builder's credit line becomes attenuated, and less of this brave speculation occurs. Since interest rates are as difficult to predict in the long run as is the weather, due to the interactions of entire economies, it might make sense to consider a model that arose from the study of weather.

This model is that of mathematical or deterministic chaos.

Research in mathematically chaotic systems by Lorenz (1963) and others has demonstrated a degree of shape and boundary to chaotic, nonlinear systems.

One problem in determining the presence of mathematical chaos is that graphic and mathematical methods are still in rapid development. This section will consider two approaches, one graphic and one mathematical.

#### 8.5.2.3 Graphing Chaos

When a variable in a time series is graphed against its next period forward, the motion of change from one period to another can easily be visualized using this "phase space" graphing method. By creating an X Y graph from the observation of a variable at time  $\tau$  and time  $\tau + 1$  respectively, with connecting lines joining each observation with the next, the patterns produced by change in a dataset can be compared with periods of change associated with known properties.

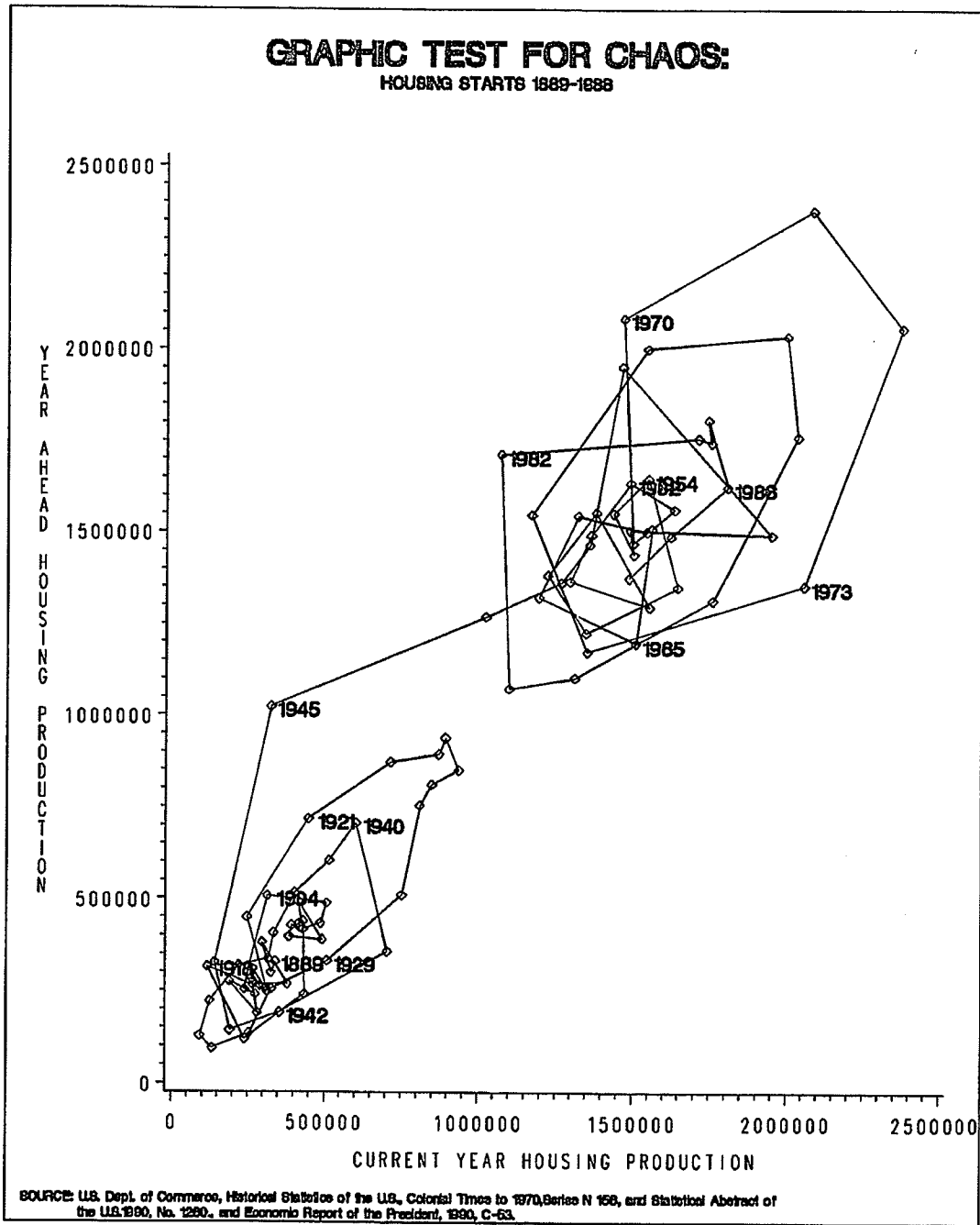
This simple graphic test has been in increasing vogue among many disciplines for a preliminary examination of mathematical chaos, as I detailed in the "Mathematical Chaos" subsection of Chapter 3. If the phase space graph of a system seems to represent "orbits" around some attracting point, then a non-random, chaotic process must be ruled out if reliable stochastic models are to be used. This  $\tau$  and  $\tau + 1$  graph of chaos can serve as a look at the magnitude of expected change.

#### 8.5.2.4 Phase Space Graphs of Selected Housing Cycles

Figure 18 is a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1889-1988. Two very messy cobweb patterns can be observed within this one hundred years' worth of data. Morrison (1991, 261) notes the cobweb shape of chaotic patterns in phase space, and I refer to the "messy cobweb" shape as one which resembles Morrison's, but with observations which do not fit the cobweb pattern, making it "messy." It is worth noting here that as the years have gone by that the number of sites surveyed by the Census Bureau have increased, and data collection methods have improved. With the beginning of the Census of Housing in

1940 that more reliable housing statistics became available than had been previously (Mason, 1982). Even so, the years 1945-1959 pose special difficulties due to the lack of a reliable itemized count of single versus multi-unit housing starts. This lack of articulation within the 1945-1959 data proves especially problematic for verifying Milton Friedman's (Saunders, 1989) statement about the MID driving a "wedge" between owner and renters.

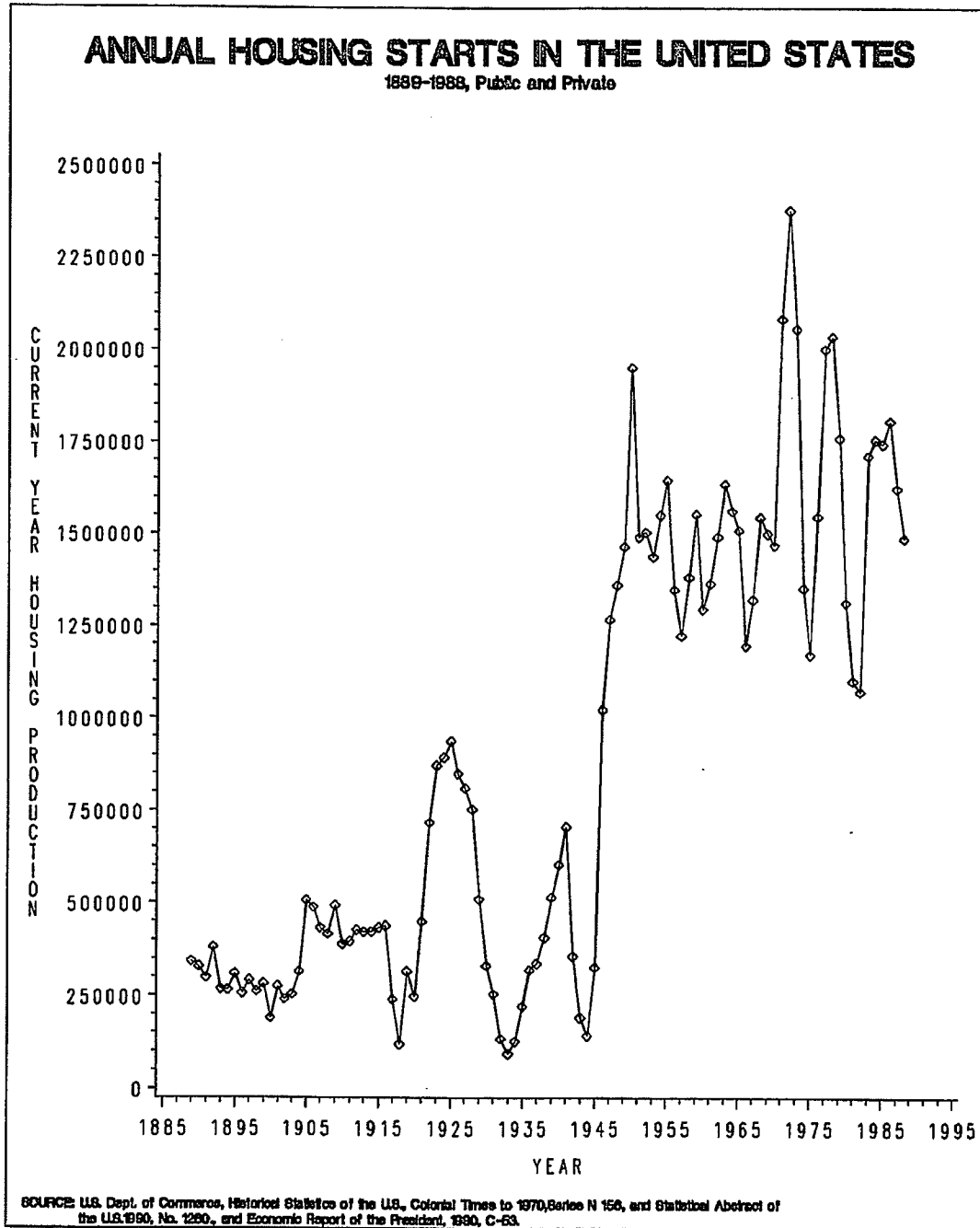
Figure 18. Graphic Test for Chaos: Housing Starts 1889-1988



It is useful to contrast this form of "exploratory data analysis" (Tukey, 1977) with the standard "state space" graph of the variable "total housing starts" over time, Figure 19:



Figure 19. Annual Housing Starts in the United States, 1889-1989



Immediately evident from these two graphs are the more dramatic housing cycles in the post-1945 period than in the pre-1945 one. The phase space graph of this earlier period shows no such easily discernable pattern, and housing starts seem to meander rather than form long cycles. Even accounting for the smaller magnitude of the earlier period's numbers, roughly one-eighth the size of the post-1945 period, with the exception of the cataclysmic effects of the two World Wars and the Great Depression, the pre-1945 does not show the dramatic swings of almost 30% in volume that the post-1945 period does.

Too much cannot be drawn from these early figures, due to the lack of resources devoted to housing Census samplings up until the time of the Hoover Secretariat in the Commerce Department when Hoover pushed, with mixed success, for consolidation of data collection among federal agencies.

Housing dipped in 1893 and again in 1900, and production doubled from the previous decade by 1905, accompanying the massive immigrations prior to World War I. By 1925 starts had doubled again.

Figure 20, a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1889-1945, provides a close-up of what could be called the first "epoch" in modern U.S. housing markets, and forms the first "messy cobweb" shape we shall consider.

Figure 20. Graphic Test for Chaos: Housing Starts 1889-1945

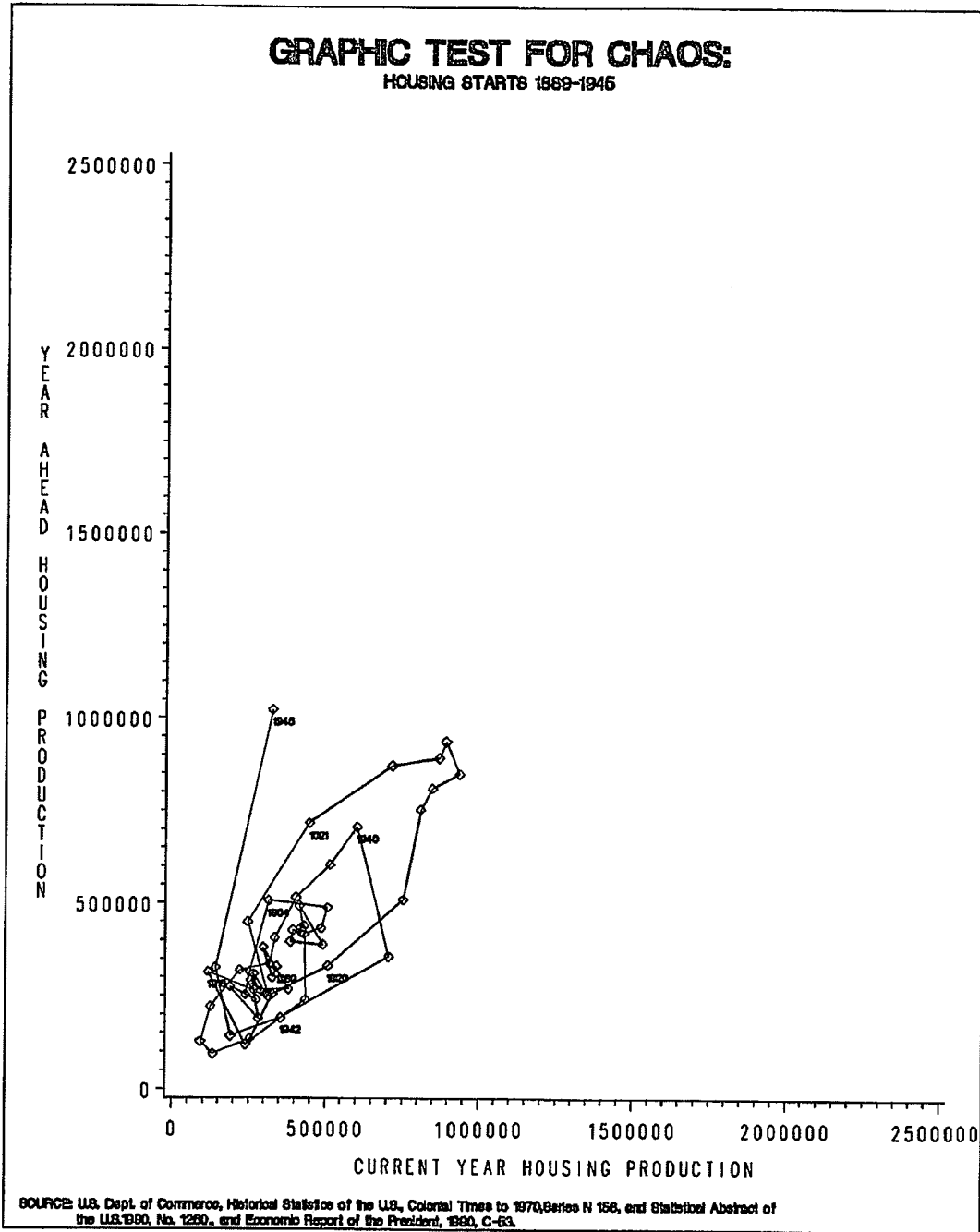


Figure 21, a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1889-1915, reveals little resembling orbits around an attractor.

Figure 21. Graphic Test for Chaos: Housing Starts 1889-1915

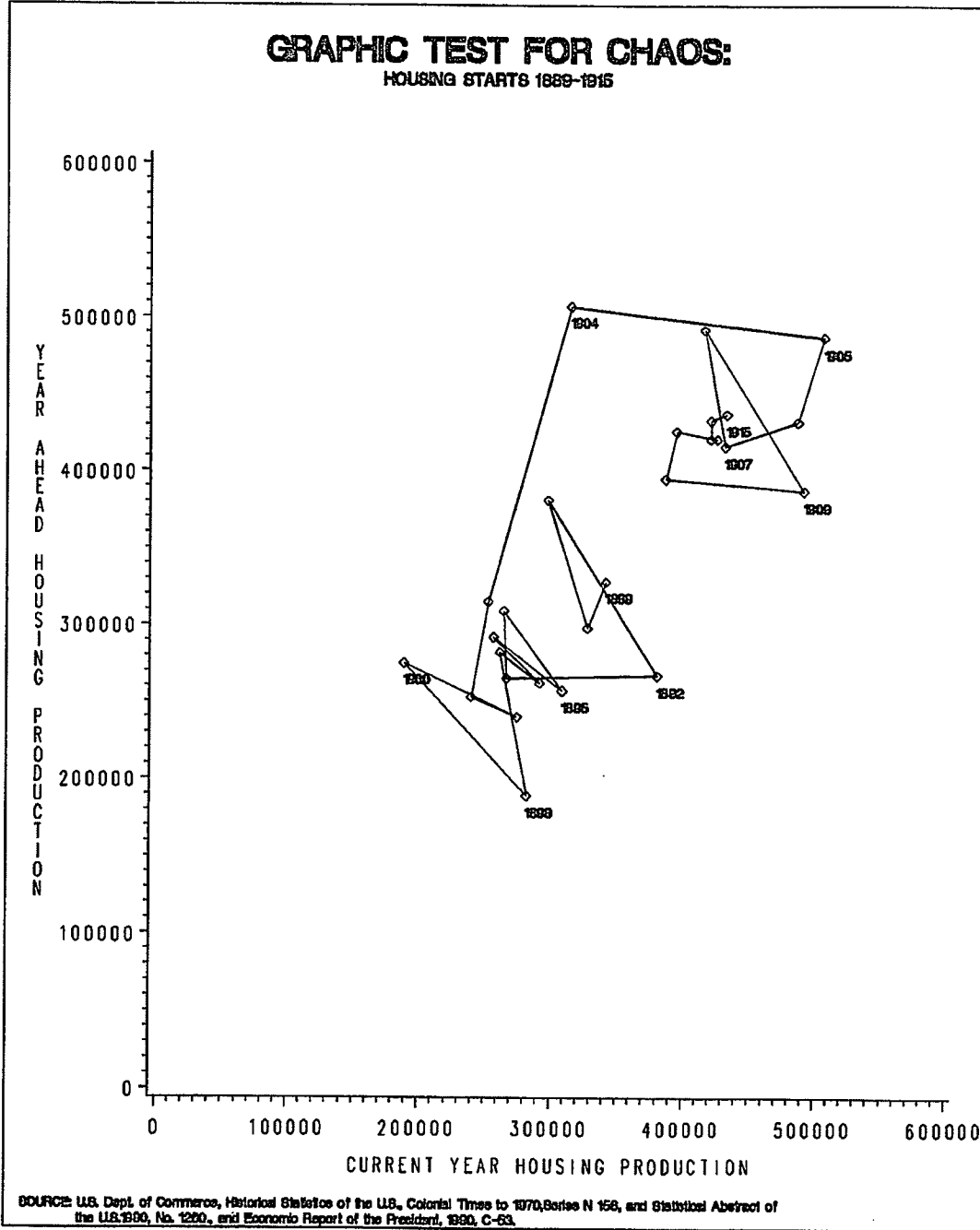


Figure 22, a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1915-1945, looks a little more promising in terms of discerning orbits around attractors.

Figure 22. Graphic Test for Chaos: Housing Starts 1915-1945

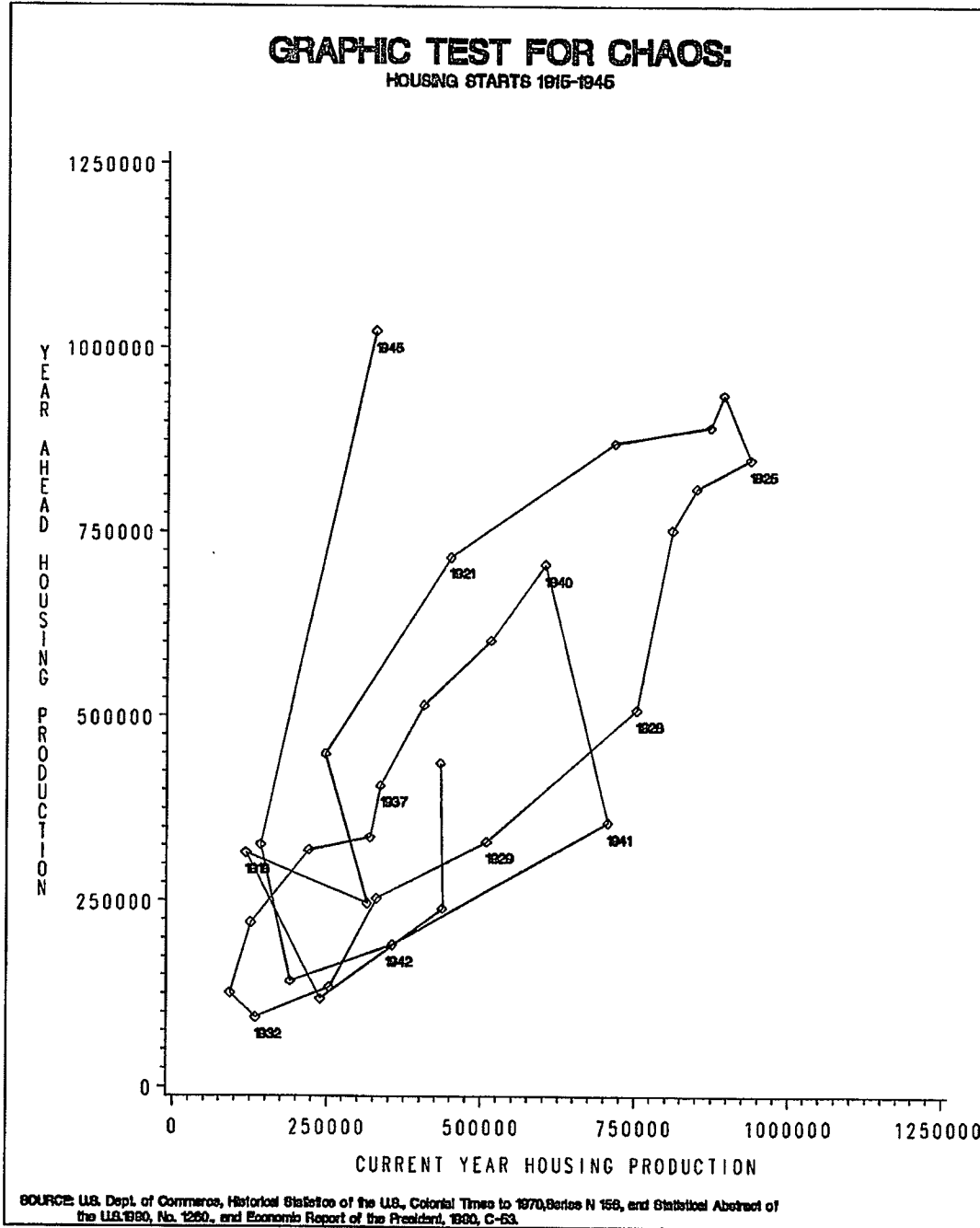


Figure 23 is a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1945-1985. This graph depicts smaller cobwebs from previous periods nested in the wilder strung webs of later years.



Figure 23. Graphic Test for Chaos: Housing Starts 1945-1985

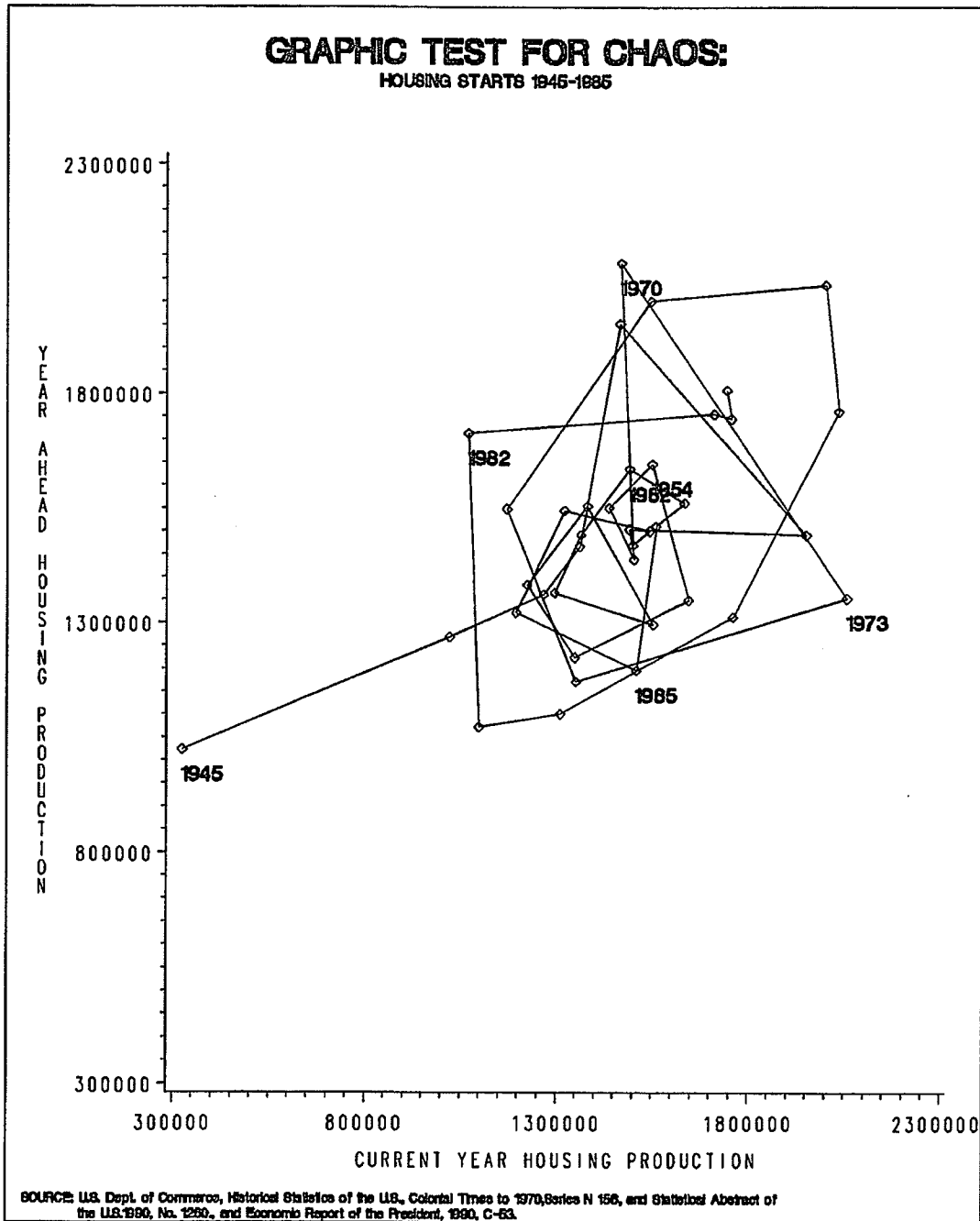


Figure 24 is a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1965-1985.

Figure 24. Graphic Test for Chaos: Housing Starts 1965-1985

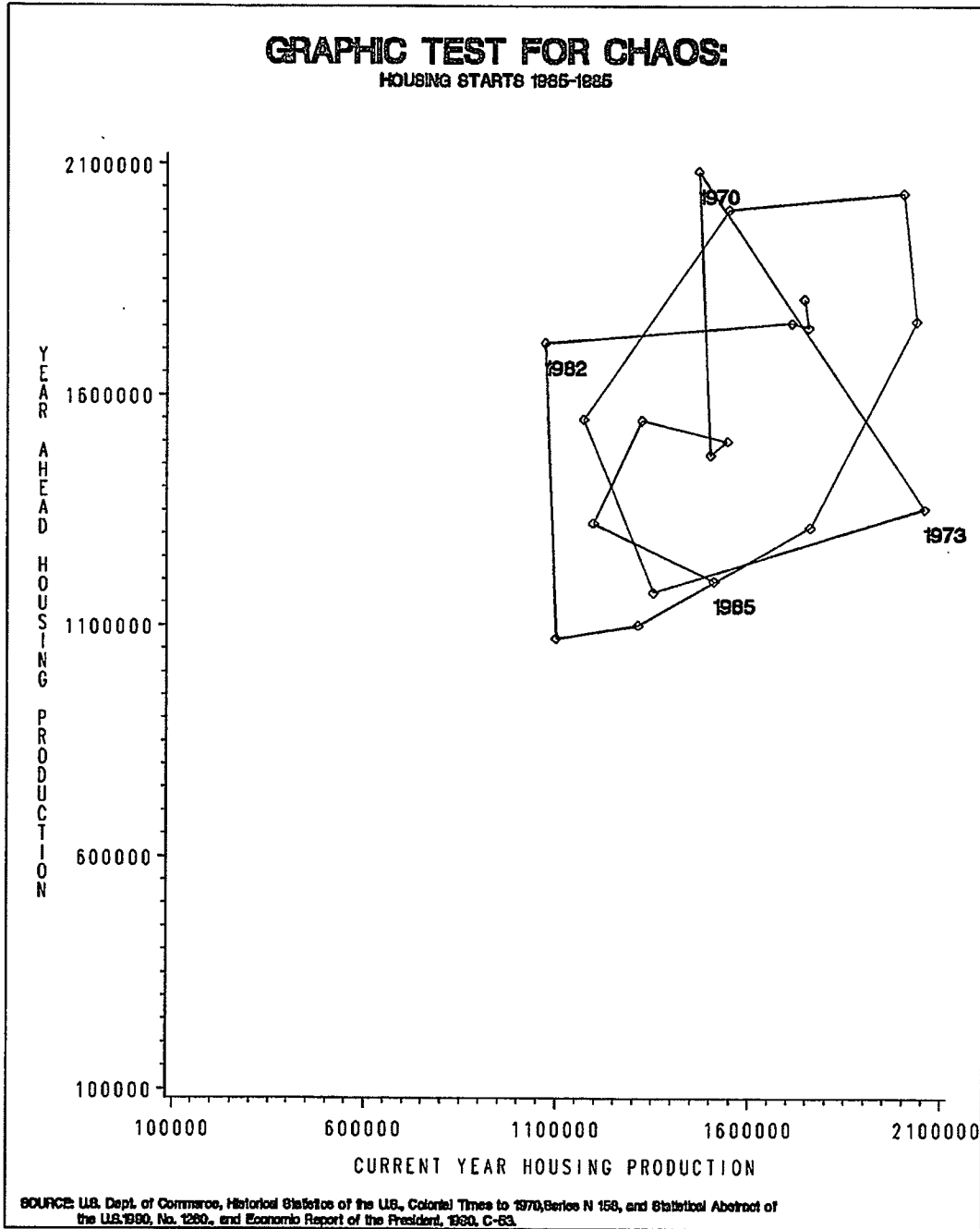
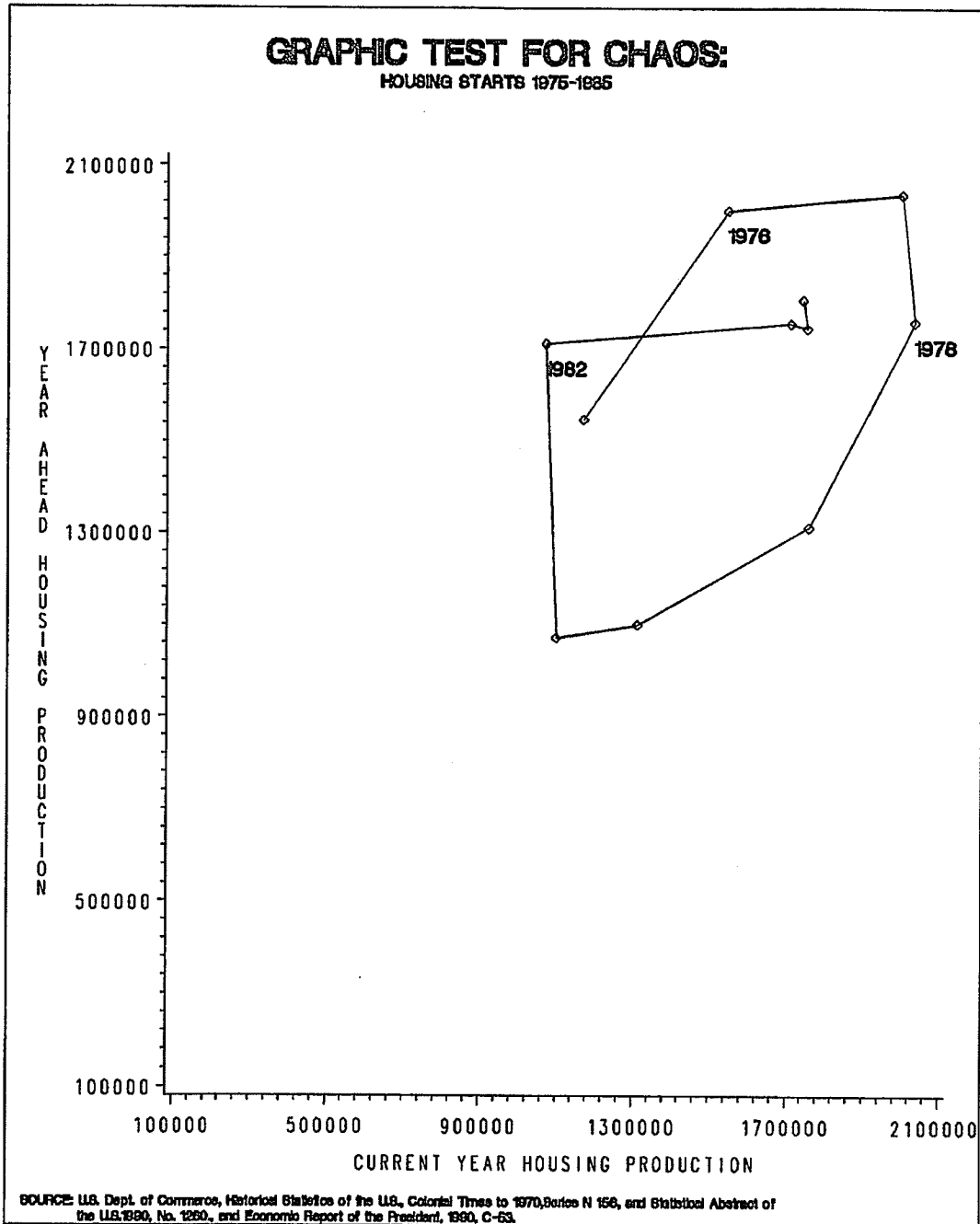


Figure 25 is a time  $\tau$  and time  $\tau + 1$  graph of housing starts 1975-1985. taken from U.S. Census and HUD and trade data.

Figure 25. Graphic Test for Chaos: Housing Starts 1975-1985



So far, the results have been mixed in our graphic tests for chaos. We have had hints of chaos, but we have also hit upon a graphic basis for dividing our 100 year span of housing data into what I like to call "policy epochs"--periods of housing policy wherein housing production seems to dwell within given limits of magnitude. We have found two "messy cobwebs," denoting two generally large policy epochs, pre-1945 and post-1945. Despite our problems with Census data, our graphic method gives us some rationale for making such a grouping of data. Within these two larger policy epochs we have selected smaller ones, which we shall continue to examine by further subdividing the data into multi- and single family housing production.

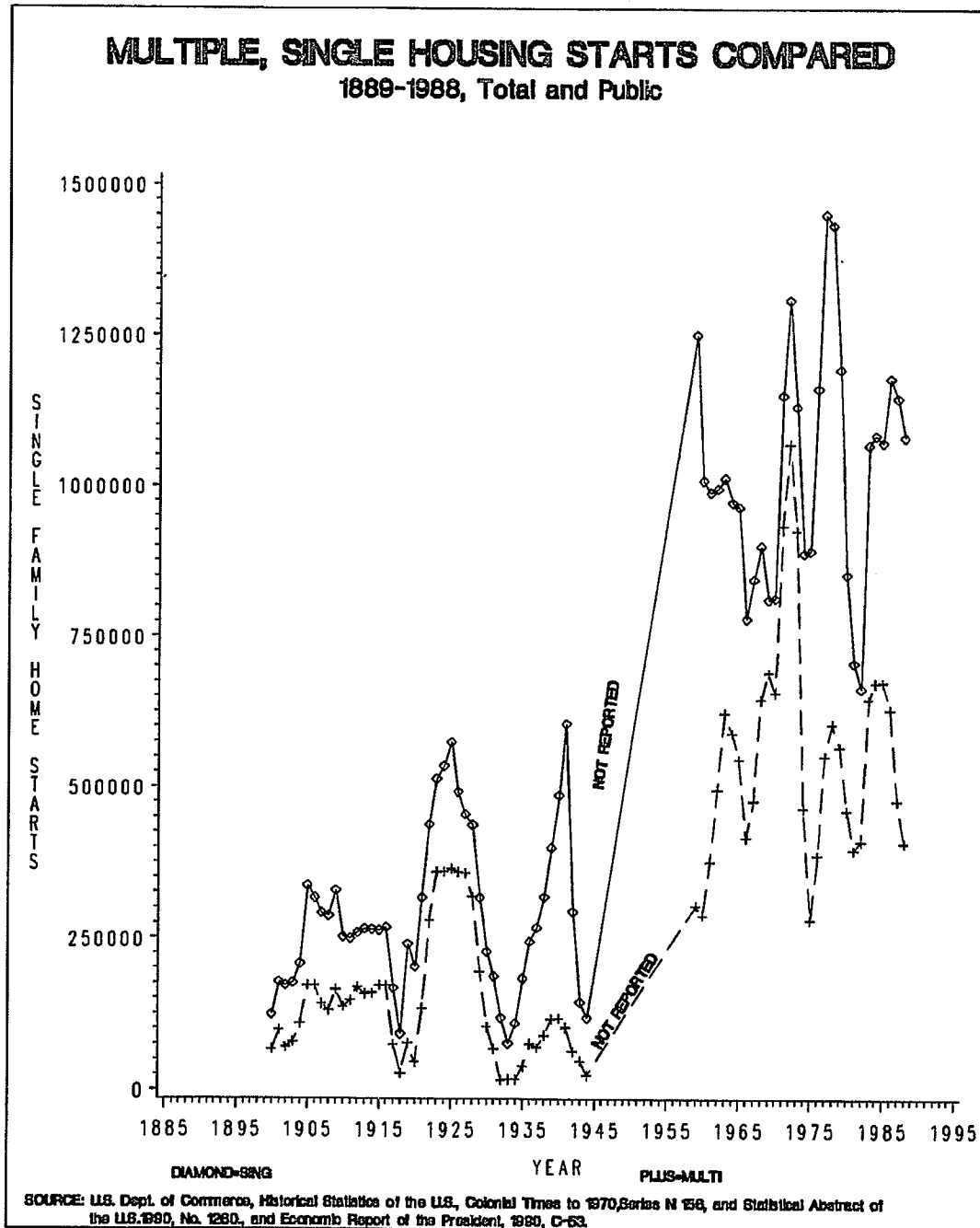
#### 8.5.2.5 Graphing Single Versus Multi-Unit Housing Production

The cobweb nature of the phase space graph is enhanced when the multi-unit component of housing starts is removed, and single and multi-unit starts are graphed separately.

Having seen that single and multi-unit starts have at some point begun to take on a life of their own, as it were, it is useful to ask, when? A statistical analysis at this point can enhance what our eyes seem to have been telling us. If we use single starts as a predictor of multi-unit starts in ordinary least squares, what will be our result?

The most interesting result is the very strong relationship between single and multiple starts in the period 1900 to 1932, with an R-Square of .94. No other period exhibits this strong a link, with the years 1973 to 1988 having an R-Square of only .19. Overall, leaving out the years 1945-1958, for which single versus multiple starts information was not collected, the R-Square reported in OLS models was .75, with the years 1900 to 1932 providing the lion's share of the fit. Appendix A contains the pertinent data. These relationships are visualized in Figure 26:

Figure 26. Multiple and Single Starts Contrasted, 1900-1988



The next step in the process is to view phase-space graphs of multiple starts and single starts, respectively:



Figure 27. Multiple Starts in Phase Space, 1900-1988

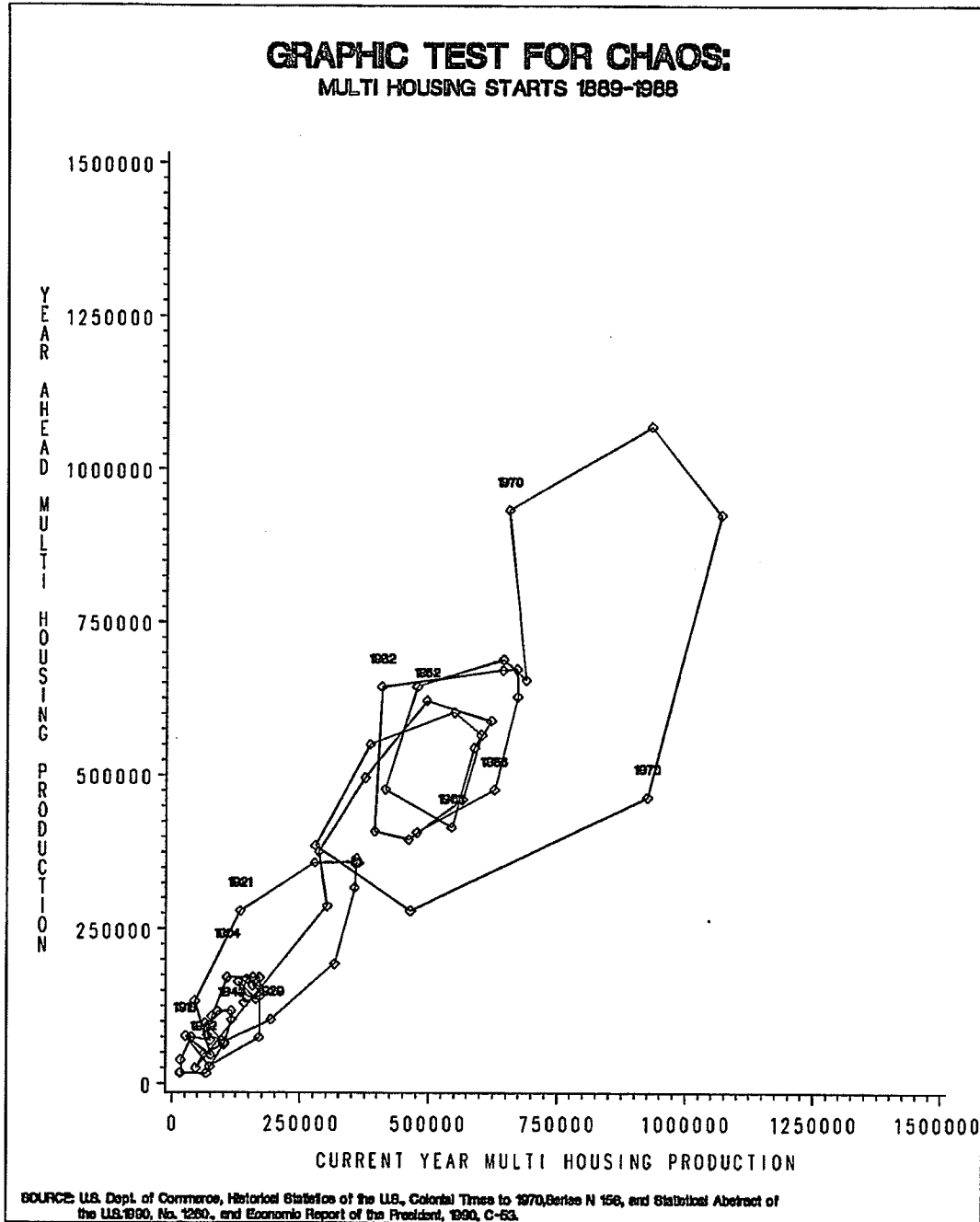
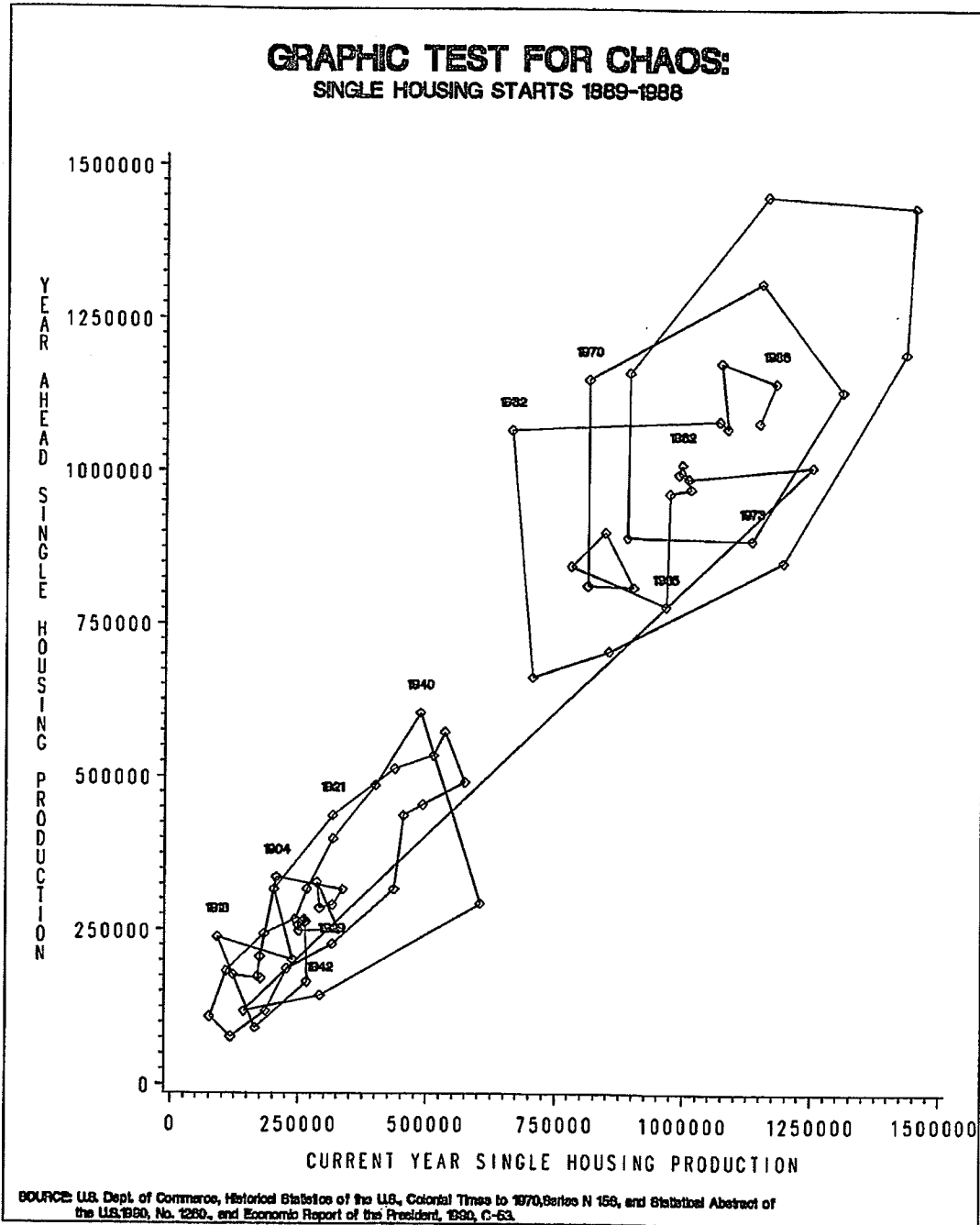


Figure 28. Single Starts in Phase Space, 1900-1988



The phase space graph of multi-housing starts Figure 27 shows an interesting development within the past thirty years. During the period 1962 to 1988, four orbits around a shifting central point can be discerned. The policy supports for multi-housing in the early 1970's clearly led to a "bulge" between 1970 and 1976, but then the phase space graph settles back into an orbit around a number slightly larger than 500,000.

In Figure 28, the same "epoch"--1962 to 1988--for single housing starts denotes three, not four orbits, with three periods of smaller sub-orbits, strangely resembling Ptolemaic epicycles of planetary recession, during the early 1960's, the late 1960's, and the mid-1980's. Obviously to the eye, different forces are at work upon single and multi-housing starts. What could have driven the "wedge" between single and multi-housing starts? Could the culprit have been the combination of the Mortgage Interest Deduction and the thirty year amortized mortgage? Could the weakening link between these variables only have been exacerbated by the changing laws on depreciation of assets in recent years?

Unfortunately, during the years 1945 to 1958, separate statistics for single and multiple starts were not reported in the historical datasets. During this period, some such numbers were reported both in the *Economic Report of the President* and in the *Statistical Abstract of the United States*, but these numbers are inconsistent in magnitude with total housing starts reported in the *Historical Statistics* either for housing starts both including and excluding farm homes.

I made some effort to estimate these missing numbers, and it soon became apparent that what few numbers were reported were so highly correlated with total housing figures, unlike the decades preceding and succeeding the 1945-1958 period, that single family starts must have been estimated from these total figures. Appendix A contains the relevant data.

What split single-family starts from multiple starts? The first thing to look at is policy factors, such as taxation and differing methods of financing.

#### 8.5.2.6 Are Quantitative Tests for Chaos Helpful in This Case?

Graphs give us a qualitative idea that there *might* be mathematical chaos, and indicate which areas to apply quantitative tests.

##### 8.5.2.6.1 The Lyapunov Exponent Test

How do we know mathematically when chaos is not present?

In non-chaotic systems, nearby orbits either converge exponentially fast, or at worst exhibit a lower than exponential divergence: long-term prediction is at least theoretically possible. (A. Wolf, 1986, 273)

A. Wolf suggested:

The Lyapunov exponent is most easily understood in this form: local stretching, determined by the logarithm of the magnitude of the slope, is weighted by the probability of encountering that amount of stretching. (A. Wolf, 1986, 275).

The use of the Lyapunov exponent test requires an initial fitting of a model to the data.

The logistic model:

$x \leftarrow rx(1-x)$ , with the arrow indicating that the resultant  $x$  from the first equation becomes the  $x$  for the next iteration,

is one for which the Lyapunov exponent has been used to determine chaotic regions.

The algorithm:

```
total <-- 0
```

```
for n <-- 1 to 4,000
```

```
  x <-- rx(1-x)
```

```
  total <-- total + ((log |r-2rx|) / log 2)
```

```
lyap <-- total/4000
```

is computed following this sequence:

The algorithm first sets  $total=0$  and then iterates the logistic formula 4,000 times. On each iteration it computes a new value for total by adding the old value of total to the logarithm of  $|r-2rx|$  divided by the logarithm of 2. (The vertical bars indicate the absolute value of  $r-2rx$ .) The quantity  $|r-2rx|$  represents the rate at which the magnitude of successive values is growing or shrinking. When it has added up all 4,000 logarithms, the algorithm divides the sum by 4,000. The result, which has been assigned to the variable  $lyap$  above, is something like an average logarithm of change. The result closely approximates the Lyapunov exponent. (Dewdney, 1991, 178-179)

Dewdney immediately thereafter noted that a positive Lyapunov exponent should warn for the existence of chaos. Unfortunately, annual aggregated housing data does not provide enough cases for the Lyapunov test to be appropriate, unless one is fortunate enough to fit a logistic equation to the data. However, the  $rx(1-x)$  formula is such a familiar one in finance and taxation, that caution need be exercised when using formulas close to that form. Note that thousands of iterations are necessary, however, to rely on the Lyapunov test.

#### 8.5.2.6.2 The Correlation Dimension Test

William A. Barnett and Seungmook S. Choi state:

The conventional structural econometric approach to estimation of minimum dimensionality is, after years of development, still of questionable reliability, even when applied to the decisions of only one economic agent. In fact, that approach does not appear ever to have been applied to the estimation of the minimum degree of complexity (dimensionality) of the structure of an entire economy. Nevertheless, most econometric models of economies are intended to represent a model of minimal complexity because unnecessary dimensionality is usually to be avoided when sample size is finite. (Barnett and Choi, 1989, 208)

Barnett and Choi (1989, 147) also indicate that while many methods exist for the detection of chaos in physics, few of these methods carry over to economics, which typically has much smaller datasets. They use the computation of correlation dimension as a technique, which approximates a method developed from fractal geometry which helps to approximate boundaries for chaotic behavior:

We use the Grassberger-Procaccia procedure for computing fractal dimensions for strange attractors.

The next integer larger than the fractal dimension of the strange attractor clearly provides a lower bound to the dimension of the space that can contain the attractor. Furthermore, because the attractor set is a subset of the state space, it follows that the next integer larger than the fractal dimension also provides a lower bound to the dimension of the state space that could contain state vector paths  $(s \text{ sub } t)$  capable of producing the observed orbit of  $m \text{ sub } t$ . (Barnett and Choi, 1989, 151)

Boiling this down into English, Barnett and Choi's method attempts to draw the boundaries of mathematically chaotic behavior.

#### 8.5.2.7 Limitations in Economic Use of Present Quantitative Tests for Chaos

There is difficulty in establishing critical parameter limits within chaotic systems. The two quantitative measures mentioned above, the Grassberger-Procaccia correlation dimension and the Lyapunov exponent, are difficult to interpret for economic data. The concept of the Grassberger-Procaccia correlation dimension, that fractal dimensions can be determined for chaotic systems, promises an alternative to the upper and lower statistical limits, but Barnett and Choi, who promote this measure as an alternative, chose to illustrate the limitations of traditional econometric measures after a theoretical discussion of the Grassberger-Procaccia statistic. Earlier, Barnett (1980, 1981, 1983, 1984, 1987) and Barnett and Chen (1986, 1988a, b) had more promising results from weekly data on Divisia monetary aggregates. Other government datasets posed problems:

Most governmental data are produced from Laspeyres or Paasche indexes, which are only first-order approximations to the true aggregation theoretic aggregate. The resulting second-order remainder terms could possibly produce a troublesome amount of noise for the nonlinear inference procedures currently available from the physics literature. Although the money supply would be an "important" variable, the official Federal Reserve System simple-sum monetary aggregates are not even first-order approximations and, hence, have first-order remainder terms that certainly are too large for our purposes. In addition, the techniques that we seek to use in this research benefit substantially from the largest possible sample sizes. (Barnett and Choi, 1989, 153)

A. Wolf also reported problems with the Lyapunov exponent method, noting that a "fundamental problem with the computation of Lyapunov exponents from experimental data is that the exponents are not rigorously defined in the presence of external noise" (A. Wolf, 1986, 289). Likewise, data required for effective use of the Lyapunov exponent is large, "on the order of  $10$  [to the  $d$  power] to  $30$  [to the  $d$  power], spanning between  $10$  [to the  $d-1$  power] and  $100$  [to the  $d-1$ ] orbits" for a system of fractional dimension  $d$ " (A. Wolf, 1986, 289).

Interpolating data points, that is, creating weekly housing figures that would simulate fluctuations within years, would bias the Lyapunov exponent one way or another, since randomized simulated weekly figures would be Lyapunov insignificant, and points drawn along the year-to-year trajectories would define the same slope as did the year previous and the year following the interpolated points, rendering the Lyapunov measure meaningless. Interpolating chaotic points between years would amount to "cooking" the data.

Another method is to get lucky and to fit a known chaotic process to housing cycles, as are certain cases of the logistic equation  $rx(1-x)$  mentioned above.

What measure, then, would provide a substitute for these measures of chaotic dimension? One technique would look at the slopes of successive trajectories in phase space.

#### 8.5.2.7.1 Looking at Slopes in Phase Space

There is some difficulty in modifying the quantitative tests for chaos in the physical sciences to make sense in economics. Could we come up with a good proxy? One might be, doing statistics on the slopes of lines in phase space. Do similar ups and downs in previous years have anything to do with today's housing cycles? If one were to accept the rational expectations commonsense proposition, that people can guess right based upon past experience, do these expectations bear out in the shape of today's housing cycles? Are actors housing markets like the proverbial Sandhurst professors of yore, expert at fighting yesterday's wars? And do their assumptions about yesterday shape today's cycles?

When the entire 100-year housing dataset is considered, and slopes are derived for the accompanying lines on the phase space graph, the results are inconclusive. R-squares hover around .1 for regressions run on the slopes of lines in phase space for the entire housing series and selected policy epochs (See Appendix A). One useful bit of information gleaned from studying the slopes of the phase space graph, however, is that only a few housing cycles in our recorded history went beyond 4 years up and 4 years down. This would indicate that buyers would have reason to be quite nervous in the fourth year of a housing expansion.

#### 8.5.2.8 Chaos in Housing Markets Wrap Up

So what did our exploration of chaos in housing markets accomplish? Some "policy epochs" do look like there could be underlying chaotic patterns in the respective housing cycles therein, specifically, housing production in the past thirty years. When single and multi-unit housing are displayed separately during this same period, their cycles display a clearer symmetry, and it seems in recent years that multi- and single housing markets have been responding to different forces or with different responsiveness to the same forces. Clearer indications of chaotic patterns are visible in multi-housing during this last thirty year period, with Vietnam era "butter" providing a clear bulge in what resembles a stable cycle. But remember, here we are talking only about what "looks like" mathematical chaos. I do not think that three or four orbits are enough for us to flatly state chaos exists.

We can flatly state, however, that we have established enough uncertainty about the behavior of housing markets that we must then base our policy recommendations on more than what national housing indicators tell us. The end result is caution in making projections of housing markets based upon deductive use of mathematical formulae alone. Beyond the use of survey instruments to offset market uncertainty, we must respond to our mathematical uncertainty by making down the line a commonsense policy decision.



As for the question of a "wedge" between owning and renting, the inconvenient absence of data for the years 1945 to 1958 weaken the case that could be made, as also do the fluctuating depreciation rates for multi-unit housing over the years. The case for a "wedge" between owners and renters due to the MID is one based upon deductions from welfare economics. It is difficult to prove empirically at present.

#### 8.5.3 Does the MID Boost the Vacation Home Market?

Yes (CBO, 1981, 1990b; NAHB, 1988).

#### 8.5.4 Does the MID Raise the Price of Housing Unnecessarily?

This question, being the one pertaining to prices, is key to the debate about the effect of the MID on the U.S. housing markets. I agree with Milton Friedman that price potentially combines much information with an incentive to act.

If James Poterba is correct, under the assumptions of 10% inflation and 25% tax rate, a 26% drop in real house prices due to dropping the MID indicates that the MID helps substantially to sustain the inflation of real house prices, and that a policy shutting off the MID would deal quite a shock to housing markets.

Key to Poterba's method is his use of rational expectations assumptions. A later study by Mankiw and Weil (1989), using a variation of Poterba's approach, made national news and engendered some scholarly controversy when they also predicted real housing prices would drop substantially over the next twenty years due to the "baby bust."

Jumps or drops in housing production have occurred at intersections (and interactions) of such factors as family formation, material prices and availability, taxes, interest rates, income, etc. In hindsight we can generally explain away dips and jumps in housing markets using terms such as pent-up demand and policy actions. But what can we say about foresight?

#### 8.5.4.1 Poterba's Models.

James Poterba (1980) of MIT developed a model of a housing market under RE which incorporates the variables of tax rate and inflation into an equation system.

The area of housing provides an opportunity for rational expectations theory because housing is one area in which the populace is relatively well informed. As Martin Mayer cleverly pointed out (Mayer, 1978), there are more real estate salespeople than there are lawyers. Mayer's quip illustrates the perception that housing is a very well informed and "efficient market," very sensitive to interest rate and tax changes. As Sheffrin (1983) stated, rational expectations theory maintains that economic models other than rational expectations models do not assume enough rational behavior. If rational behavior exists anywhere in markets, it exists in some aspects of the housing market.

Poterba (1980,1984) developed the following model of a housing market under rational expectations, separating the demand for housing by consumers from the decisions of competitive firms producing housing:

$$\text{rental cost} = Q[\delta + \kappa + (1 - \theta)(i + \mu) - \pi] H$$

Where:

Q is the real price of housing;

$\delta$  is the depreciation rate;

$\kappa$ , the maintenance and repair rate;

$\theta$ , the income tax rate;

i, the interest rate;

$\mu$ , the property tax rate;

$\pi_H$ , the nominal house price inflation rate (which Poterba assumed to be the rate of capital gains).

For simplicity's sake, Poterba defined the one-period cost of housing services from a "unit structure" with real price  $Q$  as  $\omega Q$ , where

$$\omega = [\delta + \kappa + (1 - \theta)(i + \mu) - \pi_H].$$

He represented the marginal rental value of services generated by a housing stock  $H$  as  $R(H)$ , where  $R$  is the inverse demand function for housing services, and  $R(H)$  is actually a simplified notation for  $R(h(H))$ , where  $h(H)$  is a housing stock production function.

Poterba assumed that homeowners equalize the marginal cost and marginal benefit of housing services, setting  $R(H) = Q\omega$ . He defined

$\pi$  as the rate of overall inflation;

$\pi_Q$  as the real house price inflation;

and defined the *nominal* house price inflation rate,  $\pi_H$ , as the sum,

$$\pi_H = \pi + \pi_Q,$$

where

$$\pi_Q = \dot{Q}/Q = \pi_H - \pi.$$

He then rewrote the asset market equilibrium condition as

$$\dot{Q} = -R(H) + \nu Q,$$

where

$$\nu = [\delta + \kappa + (1 - \theta)(i + \mu) - \pi].$$

Poterba then combined a gross housing industry output function,  $\psi(Q)$ , with an accounting identity for the net change in housing stock,  $\dot{H}$ , producing an expression for net investment:

$$\dot{H} = I - \delta H = \psi(Q) - \delta H,$$

where

$I$  equals gross investment.

He then approximated  $R(H)$  as

$$\log Q\omega = \log R(H) = \alpha_0 + \alpha_1 \log H$$

and then the investment supply function,  $\psi(Q)$ , as

$$INV_t = \beta_0 + \beta_1 * Q_t + \beta_2 * QN_t + \beta_3 * W_t + \epsilon_t.$$

where

$INV_t$  is the level (or rate) of investment-good production;

$Q_t$  is the real price of housing;

$QN_t$  is the real price of alternative construction projects;

$W_t$  is the prevailing wage in the construction industry.

Poterba found that if a measure of the availability of credit was added to this model, its performance improved.

Poterba then used the variable parameters generated from this model in a rational expectations simulation under differing tax assumptions.

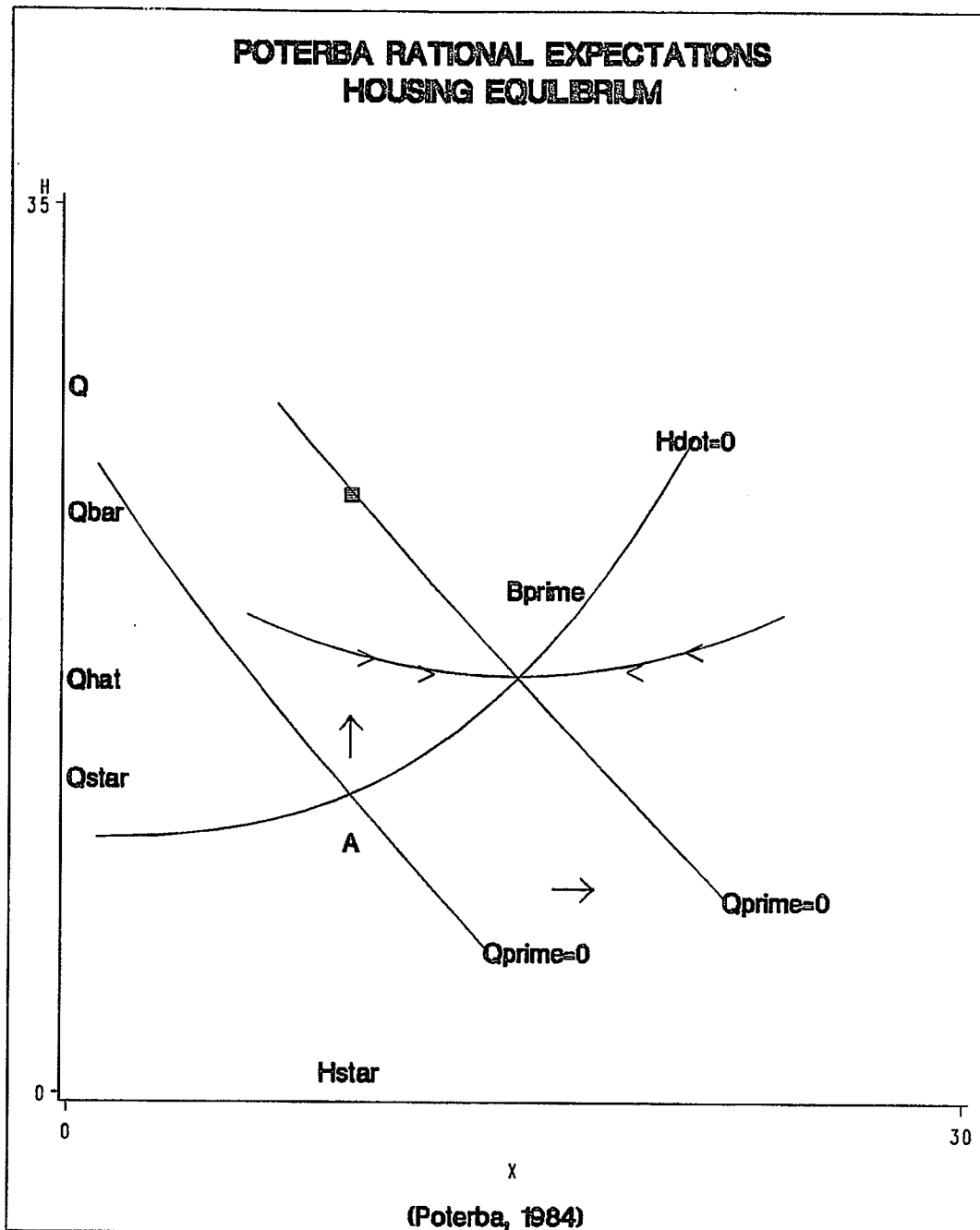
Poterba's two equation system for the housing market was thus:

$$\dot{Q} = -R(H) + \nu Q,$$

$$\dot{H} = \psi(Q) - \delta H,$$

which he estimated using US government data and a tax simulation routine developed by NBER.

Figure 29. Poterba Rational Expectations Housing Equilibrium.



#### 8.5.4.1.1 Poterba's Calibration

Poterba's actual calibration of his model

$$INV_t = \beta_0 + \beta_1 * Q_t + \beta_2 * QN_t + \beta_3 * W_t + \beta_4 * CREDIT_t + \epsilon_t .$$

involved econometric adjustments on quarterly data from the years 1964-1982.  $INV_t$  was "the real value of new one-family housing construction put in place" from the Bureau of Economic Analysis.  $Q$  was estimated by the use of "an unpublished Census Bureau price index for a constant quality new house, divided by the personal consumption deflator" (Poterba, 1984, 739). Poterba then discounted this price variable, using the one-month commercial paper rate by the average number of months homes were kept on the market prior to sale.  $QN$  "was measured as the nonresidential structures deflator from the National Income and Product Accounts, divided by the consumption deflator. Finally, the average hourly earnings of construction workers  $W$  was obtained from *Employment and Earnings*" (Poterba, 1984, 739). Poterba added  $CREDIT_t$  a "distributed lag on the net deposit inflow to savings and loan institutions" (Poterba, 1984, 740), added by the author after the initial theorizing, proved to be an important variable. The data were further transformed, in order to take into account conditions in the building industry and to stay within rational expectations assumptions. The price variables in the model were replaced by their one quarter ahead values, and the model was estimated using as instrumental variables lagged values of  $Q_t$  and  $QN_t$  lagged more than two periods, and estimated to compensate for second-order residual autocorrelation by a variant of Fair's (1970) method. Poterba ran several variations of this model, substituting in some cases  $INV_t$  divided by the GNP for the dependent variable.

In order to get an intuitive grasp of Poterba's approach, I offer the following graphs.

Figure 30. Poterba Model Graph I

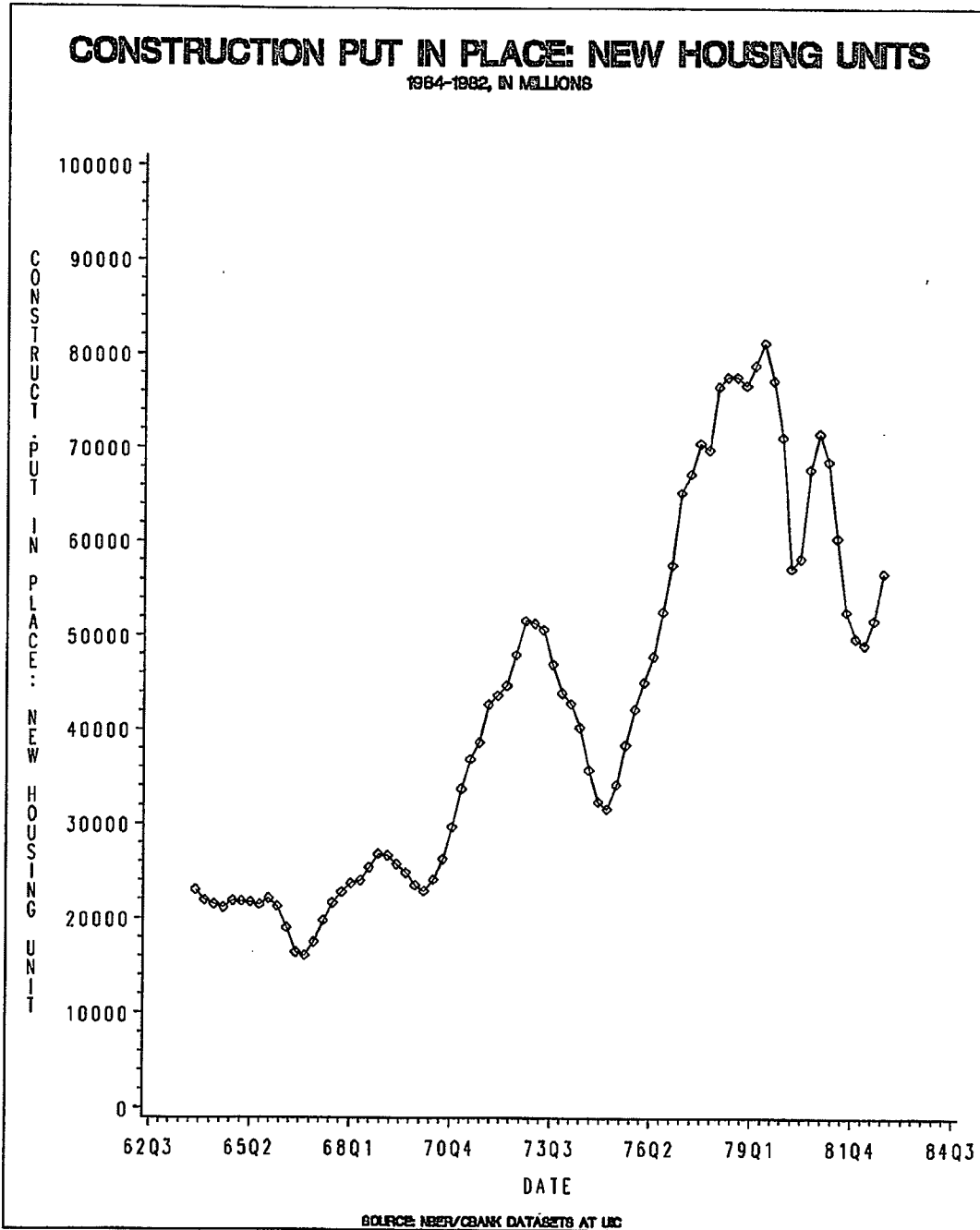


Figure 31. Poterba Model Graph II

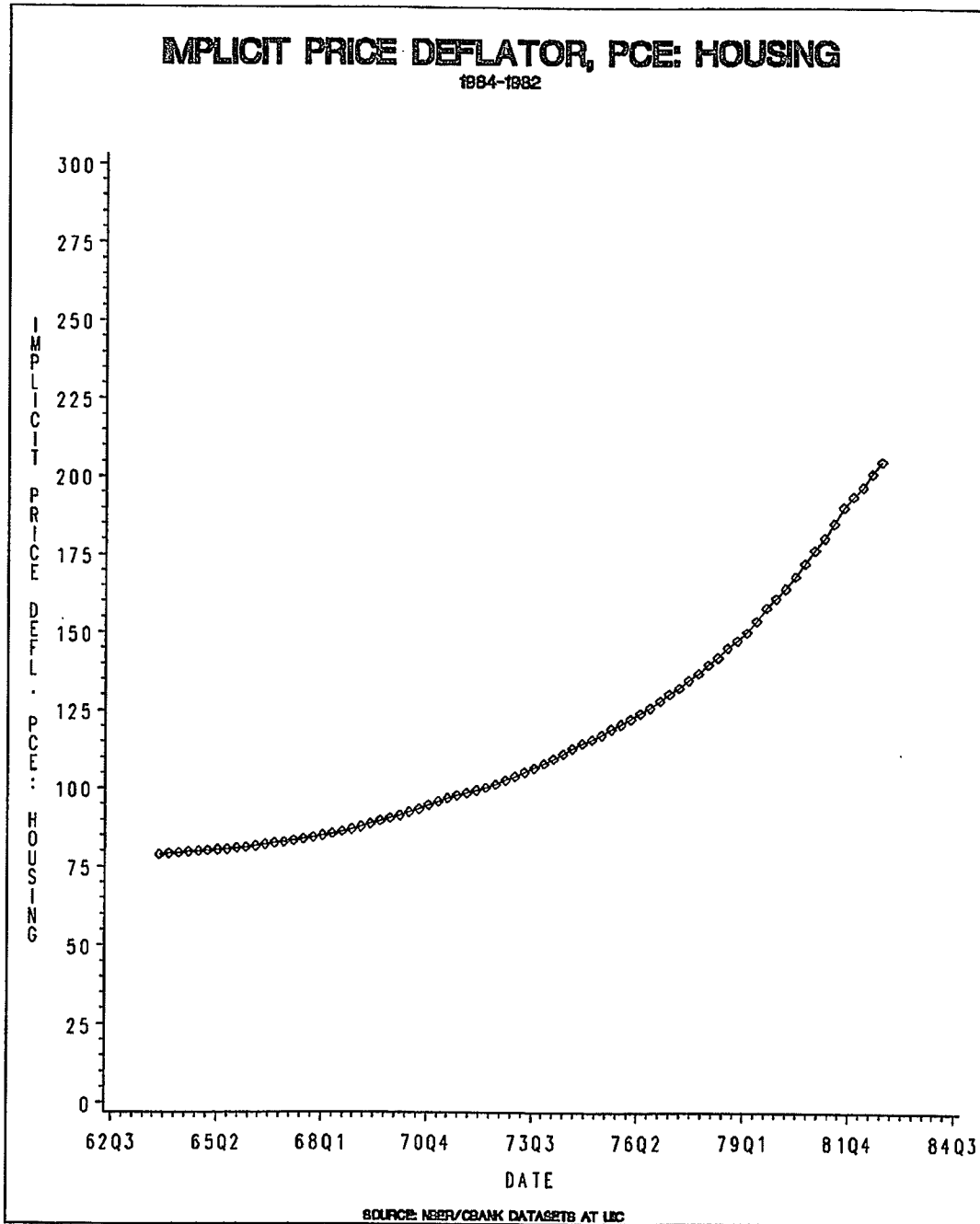




Figure 32. Poterba Model Graph III

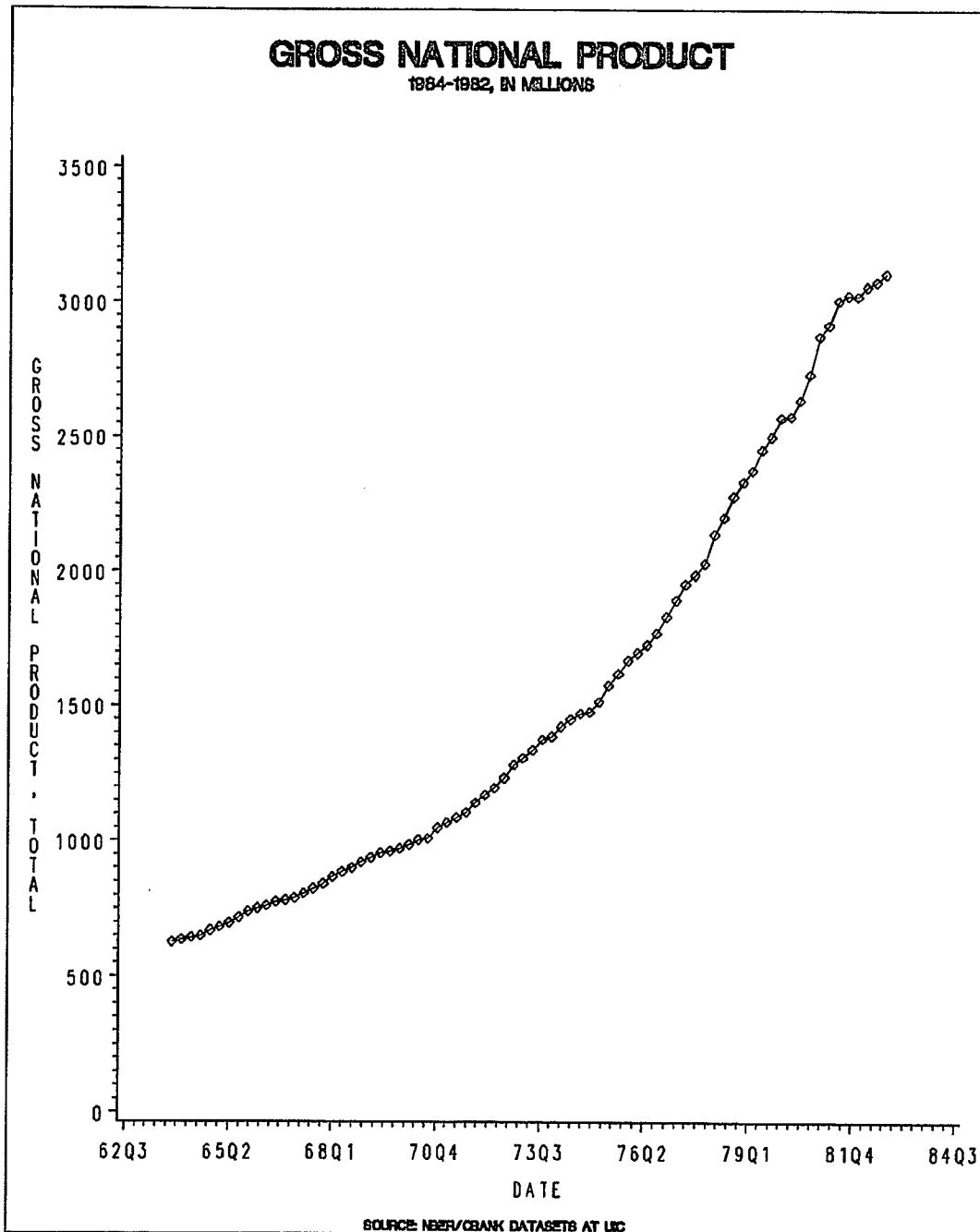


Figure 33. Poterba Model Graph IV

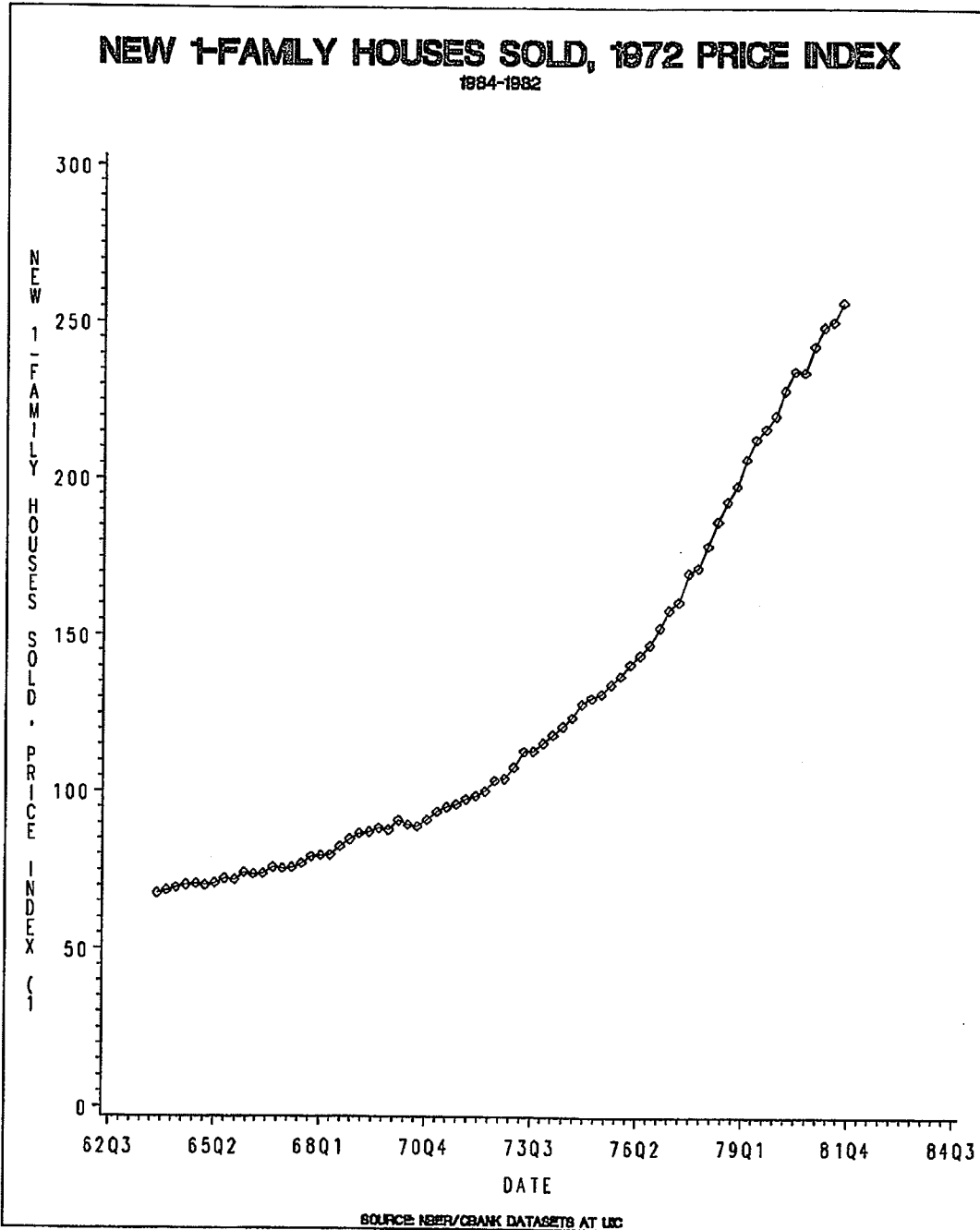


Figure 34. Poterba Model Graph V

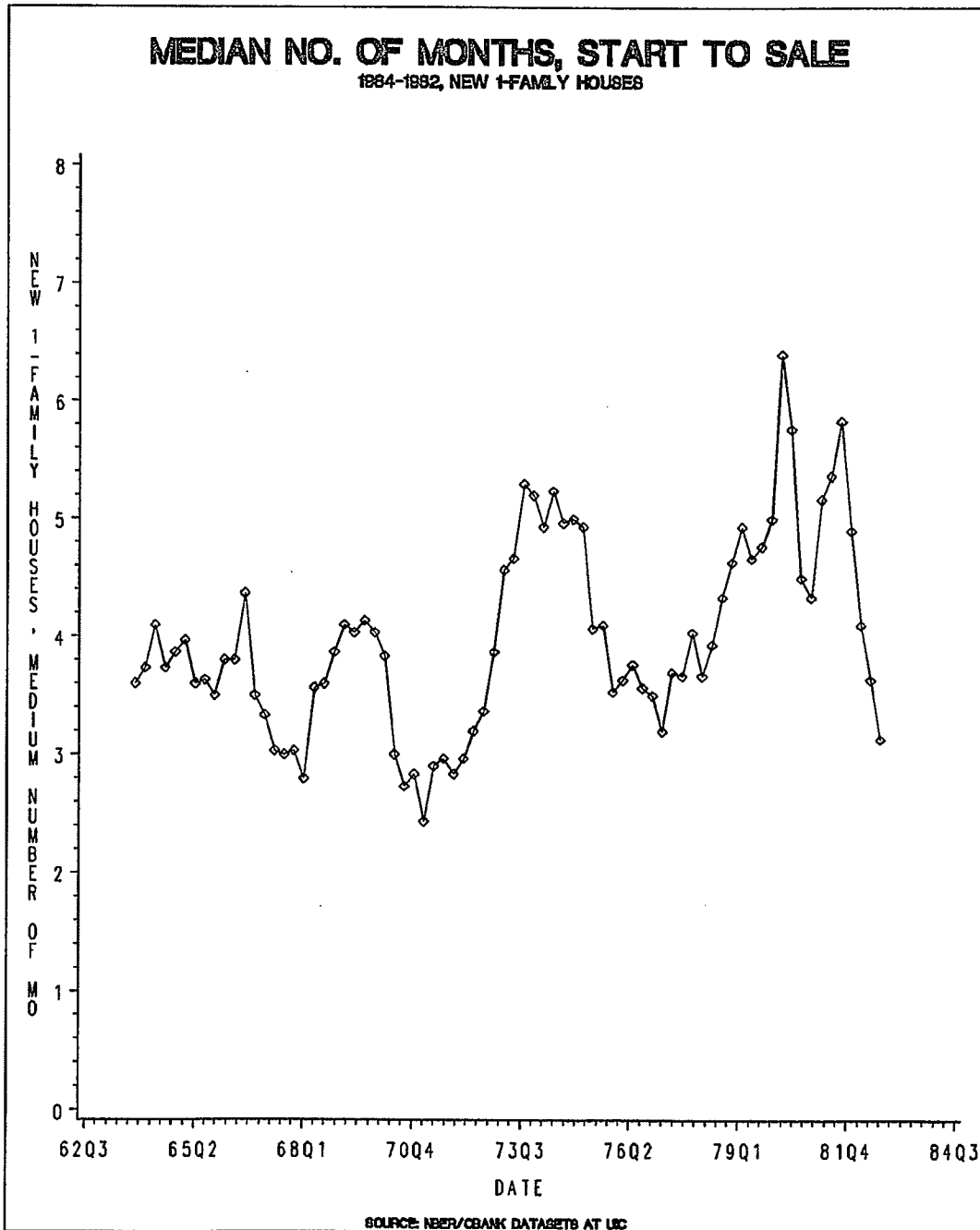
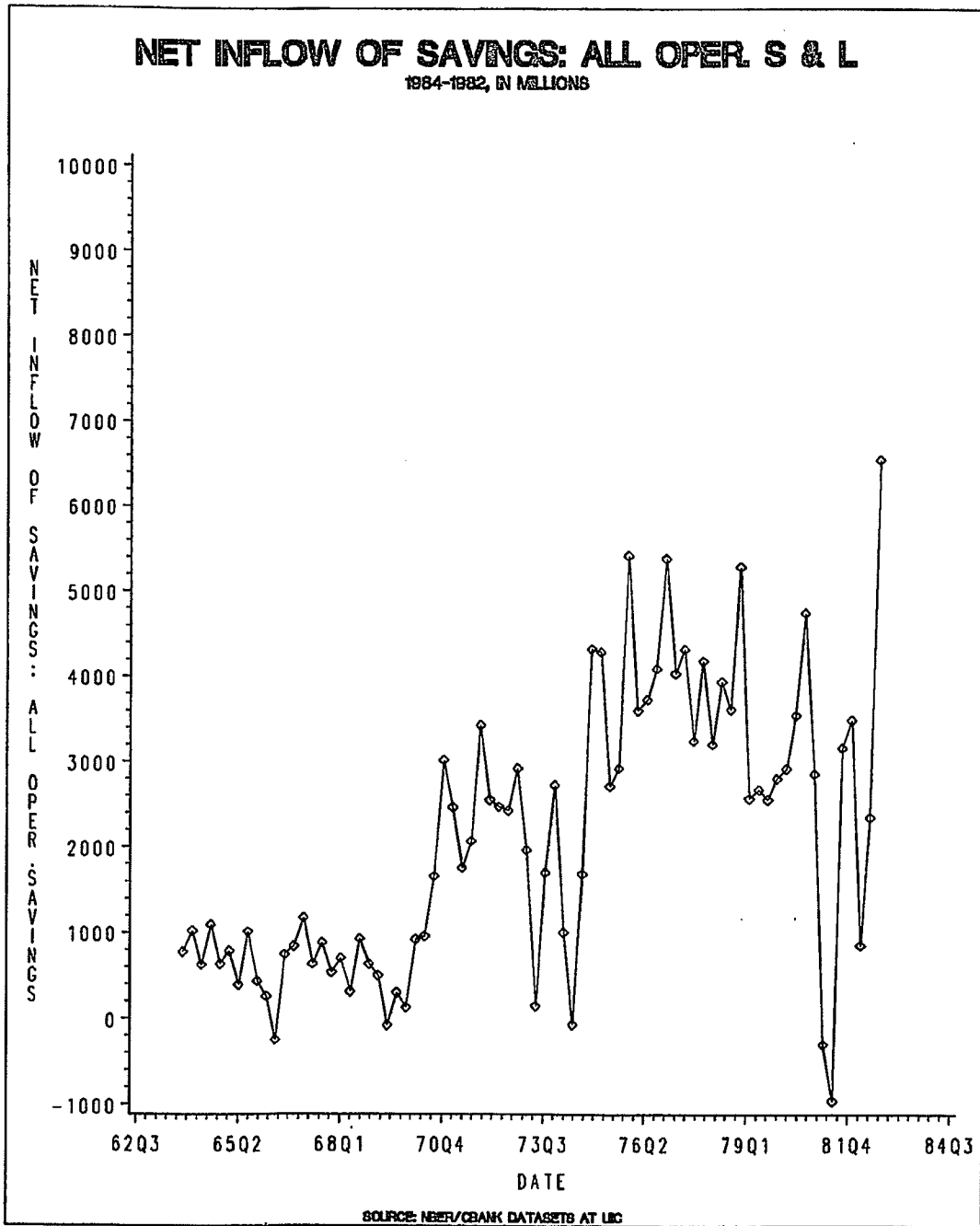


Figure 35. Poterba Model Graph VI



The parameters which Poterba derived from this model he then placed into a simulation of differing economic conditions, after further projecting the data into the future using a "multiple shooting" algorithm for rational expectations he had derived earlier (Lipton et al., 1982).

Due to the moving of computer archives at MIT, I was unable to obtain from Professor Poterba his data appendix in time for this analysis, although he kindly sent me other pertinent material. My data, obtained from the NBER-CBANK datasets on the UIC computer system, and in the case of the "unpublished price index" from published Census data, cannot be assumed to conform to the Poterba datasets, from which he consistently reported R-Square results of .9 and greater. My best results averaged about .1 less than his, with my R-Squares hovering around .85 or so, and with considerably more signs of bias. My results are listed in Appendix A.

The linch-pin of Poterba's argument for a 26% drop in real house prices stems from his assumption that the home buyer has foresight and that this foresight he models by discounting the home values by the cost of borrowing as represented by the cost of commercial paper. He then further transforms his parameter results following his interpretation of rational expectations theory by the "multiple shooting" method. This data, following Poterba's application of the method of rational expectations, is then used to estimate the effects of policy changes.

#### 8.5.4.2 The Question of Housing Market Elasticities

Key to this inquiry is Poterba's assumption that all segments of the housing market are as responsive to financial rational expectations as are some. Poterba (1984, 738) employed, following Rosen (1979) "a housing price elasticity of about minus one and an income elasticity near 0.75." One way of putting the question is, are the elasticities of housing demand and supply the same for homes worth \$100,000 as they are for homes worth \$1 million? This

same question could be posed to Mankiw and Weil, who posited across the board drops in home values due to demographic changes.

Lee Friedman defines elasticity as:

the percentage change in a variable X associated with a 1 percent change in another variable Z. The income elasticity measures the percentage change in the quantity demanded of a good X in response to a 1 percent change in income (the budget level). (Lee Friedman, 1984, 89)

The upper reaches of the housing markets are beyond FHA and VA limits, and their loan instruments, for which "jumbo" mortgages at fixed rates were rare, are much more similar to the commercial paper whose rates were used by Poterba in his calibration. Also, it stands to reason that more upper echelon home buyers than lower echelon buyers might actually know how to discount the value of their purchase based upon the present value of money, giving all the more strength to the foresight assumptions of Rational Expectations in their particular case.

As a home builder my own local observations indicate to me that, in the midst of this current recession, upper echelon homes decreased much more significantly in value than lower echelon homes, based upon actual sales of homes. But can I make a scientific (*demonstrative*) argument in favor of stratified elasticities for more expensive as opposed to less expensive homes?

In order to take the Pareto-Welfare Economics approach to housing policy, the elasticities used must be accurate. Yet eminent housing economists have reported a wide range of housing market elasticities (Stover, 1986; Harmon, 1988).

Three possibilities occur to me why this might be so:

1. bad data,
2. housing markets are segmented, with differing elasticities,

3. housing elasticities are "moving targets," changing with demographic, policy, and other factors.

The problems posed by the first in the above list are obvious. As for the second, they are not so obvious.

Some years, few luxury homes are built, keeping the mean price of a U.S. home down. The later 1980's saw years in which, as the housing cycle climbed, a larger proportion of the number and values of homes built were luxury homes.

Nationally, only 4% of the homes sold in 1983 were with sales prices of \$200,000 and over. This increased to 13% in 1987. While part of that increase reflects inflation, if the 1983 data are adjusted for subsequent increases in costs, the percentage of 1983 homes selling for more than \$200,000 in 1987 dollars is 7%. Most of the increase between 1983 and 1987 thus reflects demand for bigger, fancier, more expensive homes. The percentage of new homes with 2000 square feet or more finished area increased from 27% in 1983 to 37% in 1987.

There are significant regional variations in the prices and sizes of new homes. In the Northeast the percentage of new homes sold in price range of \$200,000 or over was 26% in 1987 compared to 10% in the Midwest, 6% in the South, and 16% in the West. The proportion of homes with 2000 square feet or more is also highest in the Northeast. The percentage of new homes with finished area of 2000 square feet or more increased from 33% in 1983 to 42% in 1987 in the Northeast, from 29% in 1983 to 38% in the Midwest, from 26% in 1983 to 33% in 1987 in the South and from 25% in 1983 to 36% in 1987 in the West. . . .

Between 30% and 35% of all new single family homes built each year are custom-built on owners' lots. Of the 386,000 single family homes built on owners' lot in 1987, 208,000 were built by a general contractor and 178,000 homes were built by the owner or the owner acted as the general contractor. Both contractor-built and owner-built homes are larger on average than homes built for sale. During 1986 only 16% of the single family homes built for sale were 2400 square feet or more compared to 24% of contractor-built homes and 25% of owner-built homes. Thus the proportion of for-sale homes sold for more than \$200,000 understates the total size of the high-end market. Taking into account custom-built homes, the share of total 1987 construction represented by homes worth \$200,000 or more was probably about 15% to 20%. (Ahluwalia, 1988, 8-9)

TABLE XVI  
HOMES OVER \$250,000 VERSUS ALL HOMES -- 1987

Comparison of Homes and Home Buyers Homes Over \$250,000 vs. All Homes		
<b>Area</b>		
Finished Area	3250 sq. ft.	1725 sq. ft.
Lot Size	22,000 sq. ft.	11,000 sq. ft.
Lot Value	\$87,400	\$25,080
Percent of Total Price	28%	24%
<b>Rooms</b>		
4 Bedrooms or more	75%	28%
3 or more Bathrooms	56%	14%
<b>Extra Features/Amenities</b>		
Skylights	66%	33%
Whirlpool	60%	22%
Central Vacuum	39%	14%
Intercoms	37%	15%
<b>Fireplaces</b>		
Over 2	93%	73%
	33%	5%
<b>Brick Front</b>		
	47%	40%
<b>Windows</b>		
Wood	49%	31%
Double Pane	72%	71%
<b>Security Features</b>		
Burglar Alarm	50%	20%
Automatic Garage Door Opener	66%	47%
<b>Buyer Demographics</b>		
First Time Buyer	10%	36%
2 or More Incomes*	44%	56%
Median Age of Buyer	42 yrs.	37 yrs.
Baby Boom Generation	61%	67%
<b>Family Type-Composition**</b>		
Husband-Wife-Children	65%	46%
Husband-Wife	29%	36%
<b>Financing Used</b>		
Conventional	86%	48%
Cash	7%	7%
Adjustable	36%	18%
30 yrs	77%	88%
15 yrs	17%	8%
<p>*Very few families buying homes for \$1 million or more have more than 1 earner</p> <p>**Family composition varies from area to area. In some parts of the country empty nesters are the predominant group buying these homes</p>		



From the above Ahluwalia-NAHB survey it is clear that housing in 1987 had a significant luxury component, which should be reflected in a higher demand elasticity than during other periods.

If we were to draw a line between those homes eligible for FHA mortgage insurance and those beyond the limits of eligibility, we might see that, due to government support, the homes within FHA limits were less subject to dramatic roller-coaster rides of the housing cycle. Federal mortgage insurance for homes in the "more affordable" range has succeeded to a degree in "smoothing" the housing cycle for FHA insurance eligible homes. The following two graphs give us an idea of the relative motions of those mortgage insurance policies and guarantees within FHA-VA limits and those above.

Figure 36. Mortgage Insurance and Guarantees Approved, 1970-1986

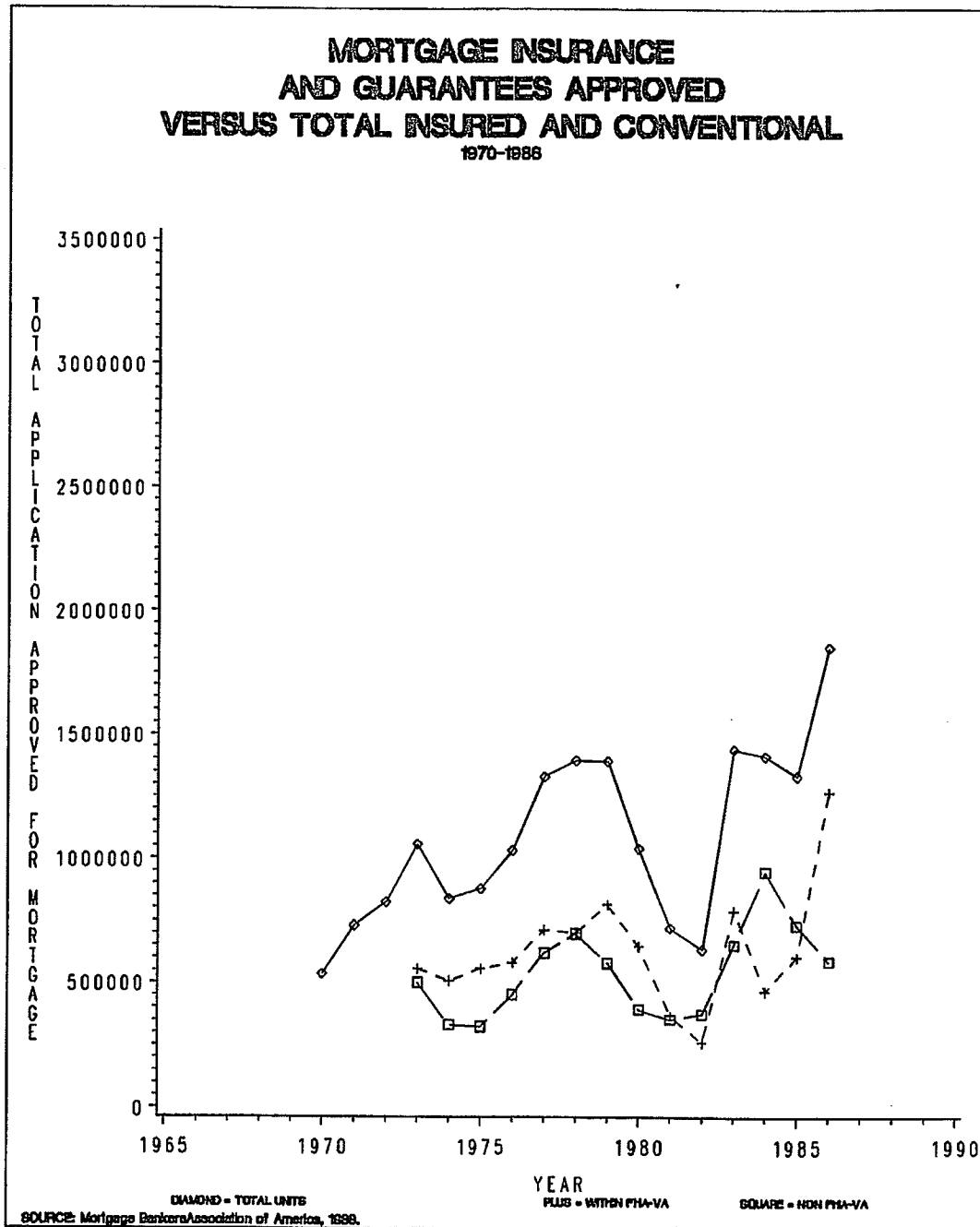
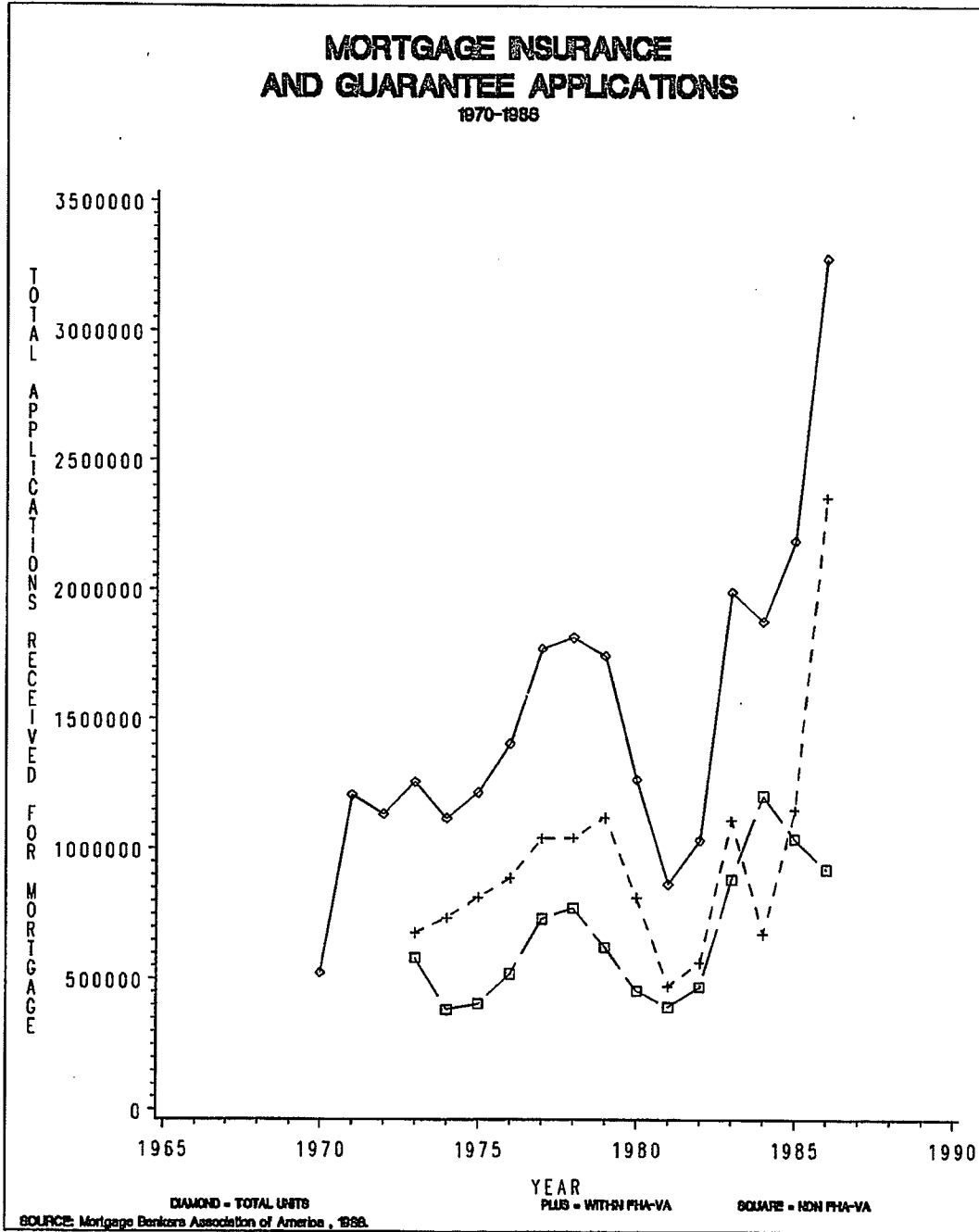


Figure 37. Mortgage Insurance and Guarantee Applications, 1970-1986



Note the baseline activity of FHA and VA approvals, until the market "went bonkers" as interest rates dropped and applications far exceeded approvals. Applications give a good indication of how many *more* Americans want to own a home than are capable of it, and could be used to modify estimates of income elasticity based solely upon approved applications, that is, closed sales. Note also, as mentioned above, that 7% of new homes purchased in 1987 were done so with cash. When one factors in an unknown number of existing homes purchased with cash, the magnitude of the 1980's boom market and the difficulty of measuring segments within it become apparent.

In order for the luxury home market to heat up, new buyers have to be capable of selling their old home in order to buy a new home. As one approaches the "top of the selling chain," the longer a period of sustained growth is necessary to give buyers the confidence to buy a much larger, luxury home, for during this period of sustained growth more owners of \$100,000 homes buy \$200,000 homes, \$200,000 home owners buy \$300,000 homes, and so on. Only a few housing cycles in our history were long enough to encourage dramatic spending on luxury homes, with the 1920's and the 1980's coming first to mind. Obviously, demographic conditions must be right, with enough people with enough income to purchase such luxury. By the same token, builders must have confidence that a luxury market will continue in order to make the kind of decisions far in advance to purchase luxury land and develop it. Only a few periods of continuous housing expansion exist during this century, as could be seen by close examination of Figure 2.

The welling-up of a number of luxury homebuyers near the end of a housing expansion, along with a flood of marginal buyers who do not qualify for home purchase argue for taking intertemporal factors into account when considering housing elasticities, especially those of the luxury market, which stands to be impacted first by reductions in the MID. These factors interact with those joining different strata of the housing market.

The third, "moving target" question about housing elasticities is actually a related one to the second. Are there periods in a housing cycle when a greater proportion of the housing purchased and produced is a luxury as opposed to a necessity? The difference between luxury and necessity is related to the concept of elasticity itself:

A necessity is a normal good whose income elasticity is less than 1. . . . A luxury good, on the other hand, is a normal good whose income elasticity is greater than 1. (Lee Friedman, 1984, 89)

Inferior goods, of course, are those with income elasticity less than one. Lee Friedman uses the example of spaghetti and potatoes: we buy less of them as income rises.

We already noted that the MID, according to the CBO (1981), accounted for about 10% consumption beyond the size and/or features of a home purchased had there been no MID. Increases in income or decreases in interest rates or taxes could also encourage overconsumption of housing size and features. Are there periods during historical housing cycles where the "point" elasticities (Apgar and Brown, 1987, 126) related to housing demand and supply differ significantly? To put it another way, are housing elasticities the same for markets weighted by 5000 square foot behemoths with turrets and stairways leading nowhere as they are for those weighted toward FHA tract homes?

Smith (1976) attempted an answer to a related problem by drawing the distinction between the supply of housing quality and the supply of housing density, and arriving at an elasticity of substitution which was not significantly greater than 1.0 (McDonald, 1979, 79-81).

McDonald (1979, 92) later used the fact that a tested elasticity of substitution was .86 for new housing in Chicago and its estimate declined .018 per year to reject the then proposed assumption of perfectly malleable capital in developing a model of the Chicago housing market.

Oskar Harmon (1988, 183) found in a review of previous work, that the elasticity of demand for single family housing is "highly sensitive to duration of housing tenure," and

recommended using an elasticity of .70 for short-run modeling and 1.0 for long-run modeling, for a period 1968-1973.

Dennis Glennon (1989) took up the question of the lack of consensus on the elasticity of housing demand, and using a stock-flow model for the period 1965-1984 which addresses to a degree some of the assumptions I mentioned above about the dependence of wealthier move-up buyers on other less wealthy buyers to buy the formers' homes, and arrived at income elasticities of housing demand of -0.579 for the short-run and -1.07 for the long-run. His long- and short-run price elasticities fell between -0.40 to -0.90, while his interest elasticity of housing demand was -0.37.

David Harrington considered what I referred to above as the "moving target" question of elasticity, and concluded:

A single price elasticity does not exist which is capable of predicting the response to all changes in the user cost of housing. The response depends on the source of the change of user cost. (Harrington, 1989, 230)

Harrington went on to state:

It may also be possible to obtain a more precise estimate of the intertemporal substitution effect. This would involve using the favorable tax treatment of homeownership and the income profiles of households to generate user cost profiles. These user cost profiles could then be used as another source of price variation to estimate the intertemporal substitution effect. (Harrington, 1989, 244)

Poterba's "estimated elasticities of the rate of new construction with respect to real house prices range between .05 and 2.3, depending on model specification" (Poterba, 1984, 741). He also found that when the real price of nonresidential buildings increased, this had a "depressing" effect on new housing investment, with this "cross-price" elasticity varying between -0.9 to -1.8. From this Poterba drew the conclusion that public works projects might draw resources away from housing (Poterba, 1984, 743).

#### 8.5.4.2.1 Elasticity Wrap-Up

Elasticity remains an elusive question in housing markets. This is not surprising, since housing is a composite good. For many years, housing was considered to have the same elasticities as "everything else," since housing represented such a complex combination of items. Until the housing market is effectively broken down into its components, there will be great difficulty in deriving accurate welfare measures for questions of housing and taxation.

#### 8.5.4.2.2 Difficulty of Measurement of the Land Component

One difficulty with an approach such as Poterba's is that housing was treated as a good separate from land. Note again, from Ahluwalia-NAHB table above, that land composes almost a 20% larger share of the price of a luxury home than of an average home, and this would remain a hidden variation within any deductive model of a housing market.

One good proxy for the value of land would be real estate taxes, but reliable aggregate data are hard to come by. County assessors are loathe to make public current data, which now every analyst with a souped up microcomputer is capable of crunching into interesting and sometimes politically embarrassing facts. But of analytical necessity and public good, the day of national real estate tax and land value data will come.

#### 8.5.5 Does the MID Drive Marginal Tax Rates Higher?

This the CBO (1981) held. An almost \$50 billion tax advantage would have to drive up marginal tax rates. If this is the case, it is a further penalty on renters. Woodward and Weicher (1989, 310) recognize that the present amortization structure of mortgages creates a "tilt" toward the early years of the mortgage in terms of deductibility. This certainly had the potential for driving up marginal rates when the majority of the population had "young" mortgages.

#### 8.5.6 Does the MID Increase Home Equity Lending?

The recent boom in home equity loans has been attributed in part to the Tax Reform Act of 1986 and the 1987 OBRA's restricting deductibility for other loans, exacerbated by the recession. Present 1991 estimates put only 35% of the total \$37.43 billion outstanding in home equity loans as devoted to home improvements, and the Federal Reserve Board reported that home equity lending increased almost \$7.5 billion from 1990 to 1991, an increase of nearly 25% in one year (Currier, 1991). The General Accounting Office is now studying whether the volume of home equity lending increased as a direct result of the 1986 tax act (Crenshaw, 1991). Any change in the MID would of course affect home equity lending, now presently used for everything from consumer spending to college tuition loans.

#### 8.5.7 Does MID Allow More Homeowners to Itemize Deductions than Renters?

This position has not been much in dispute. Both CBO (1981) and Pierce Hall (1987) found this to be the case. Woodward and Weicher (1989, 305) noted importantly that the 1986 Tax Reform Act, by raising the level of deductions at which taxpayers can choose to itemize deductions, has led more homeowners to claim the standard deductions rather than itemize deductions, thus limiting the advantage that homeowners had over renters as far as itemizing deductions.

#### 8.5.8 Does the MID Benefit Primarily the Rich?

Indications are pretty strong that this is the case. According to figures prepared by the Joint Committee on Taxation, "Nearly one-third of last year's \$47 billion homeowner-related tax deductions will go to the 3.8 percent of taxpayers with adjusted gross incomes of more than \$100,000" (Lehman, 1991). The response comes from the NAHB that these people pay 23% of the US taxes (Lehman, 1991). Simple arithmetic indicates that a greater portion of homeowner deductions go back to this upper income group than the portion of total income



taxes paid, with a 10% margin in favor of the upper-income taxpayers. Woodward and Weicher (1989, 302) maintain that the ownership of property is already skewed toward the rich, and that "the Mortgage Interest Deduction counters this tendency toward further skewing" by making the purchase of homes such as first-time homes more affordable in terms of life-time income. They recognized, however,

that the cross-sectional pattern of the Mortgage Interest Deduction is regressive, simply because owners have higher incomes than renters and elderly owners who have paid off their mortgages have lower incomes than working-age homeowners, on average. (Woodward and Weicher, 1989, 310)

#### 8.5.9 Does the MID Increase New Construction?

The CBO cited an earlier study by Hellmuth (1977) to support this view. The NAHB certainly thinks this is true, and regularly repeats this message (Bannister, 1988).

#### 8.5.10 Does the MID Increase the Homeownership rate?

Comparisons of homeownership rates in countries with and without a MID are tantalizing but inconclusive. Canada, which does not have a MID, has a comparable rate of homeownership to the U.S., while Switzerland, which does, has a much lower rate (Saunders, 1989). That Canada, with a smaller rate of poverty than the U.S., would have comparable homeownership rates without a MID might indicate that the U.S. MID could offset some effects of poverty in the U.S. But comparing countries with different population wealth and poverty proportions and different tax and market structures over one policy issue can be misleading. A better method to compare countries is to estimate and compare their real after-tax cost of housing relative to their population. These "indexes of housing affordability" indicate that the U.S. ranks quite high in "housing affordability" when compared to other countries. These figures are reported regularly by NAHB in their publications.

Econometric estimates of the MID on the extent of homeownership have estimated that total homeowner tax preferences, according to CBO's (1981, 27) interpretation, have accounted for about one-fourth of the increase in U.S. home ownership since World War II. The increments in home ownership attributed to the influence of homeowner tax preferences varied with the study, with Harvey Rosen (1978) finding the MID's contribution to be from 2.5 to 5.5 percent of homes in 1970, to 4 percent of homes in 1974 (Harvey and Kenneth Rosen, 1980), to 4 to 5 percent of homes owned in 1978 (Hendershott and Shilling, 1980) during the more inflationary later 1970's.

#### 8.5.11 Does the MID Encourage Overconsumption of Single-Family Housing?

CBO noted that the studies above estimating that buyers purchased homes during the post-war period which were 10 to 20% more expensive than those which they could have afforded without homeowner tax preferences. Since the MID accounts for approximately two thirds of homeowner tax preferences (CBO, 1981, 7) it could be said to account for the majority of the effects of homeowner tax preferences on home ownership.

If homeowner tax preferences lead buyers to buy homes 10 to 20% more expensive than they would have without them, and since the MID accounts for about two-thirds of the value of homeowner tax preferences, then the MID does encourage over-consumption. However, if you consider this consumption as "savings" in a future asset, then it remains a point of controversy.

#### 8.5.12 Does the MID Distribute Taxation over a Lifetime?

In a defense of the MID, Woodward and Weicher (1989) built a system of two principal equations comparing the cost of owning and the cost of renting. In their system, the Cost of renting is:

$$R = V(r + m^*) - APVDepr/(1-t^*) - APVGain/(1-t^*).$$

Where:

- r** is the before-tax opportunity cost;  
**t\*** is the landlord's tax rate;  
**R** is the rent;  
**m\*** is the expenses of operating, including maintenance,  
 expressed as a fraction of property value;  
**t** is taxes paid by the landlord in the rental property income;  
**V** is the value of the building;

**APVDepr** is the real annuity value of the depreciation tax deferral  
 given the optimal turnover of the property;

**APVGain** is the real annuity value of the after-tax gain  
 on the sale of the property--this variable includes  
 recapture. (Woodward and Weicher, 1989, 305-306)

Woodward and Weicher's cost of owning is:

$$C = V(r(1 - t) + m - a).$$

Where:

- D** is the market value of the debt;  
**r(d)** is the prevailing nominal rate of interest on  
 mortgage debt;  
**t** is the homeowner's marginal tax rate;  
**E** is the value of the house less D;  
**r(e)** is the nominal opportunity cost of the equity;  
**V** is the market value of the house;  
**m** is the percent of value for maintenance required  
 to keep the house from depreciating; and  
**a** is the nominal appreciation rate of the house.

(Woodward and Weicher, 1989, 303,306)

Woodward and Weicher (1989, 304) simplified their equations using the Miller and Modigliani proposition "that the cost of capital is independent of the relative amounts of debt and equity." Inexplicably, the "t" variable dropped completely from the authors' (1989, 305) Cost of Renting equation even in its first formulation, and the authors did not explain why. It is not clear from the text whether or not this "t" variable is a property tax variable, since a property tax variable is also missing from the Cost of Owning equation.

In the case of rental property, property tax is often "passed through" to the renter, and is nonetheless offset against gross earnings by the landlord, thus reducing taxable income. The renter does not receive the benefit of the property tax deduction, unless it is the rare case that the landlord deducts real estate taxes and does not offset such taxes against gross earnings.

While real estate taxes can be said to be contained in the authors' "after tax" "APV" variables or in their "maintenance" variables, its variability from jurisdiction to jurisdiction in rates and *vis a vis* single family taxation and from period to period effects the variability of rents across locations. For example, in Cook County, Illinois an apartment building with more than six units is taxed at 33% of assessed value, while one with six units or under is taxed at 16%, as is single family housing. In the case of owner-occupied residences, property tax is discounted by the federal deduction for same. It will not do to assume that these taxation processes are equivalent for rental and single family housing and to assume property taxes away as a determinant of housing cost.

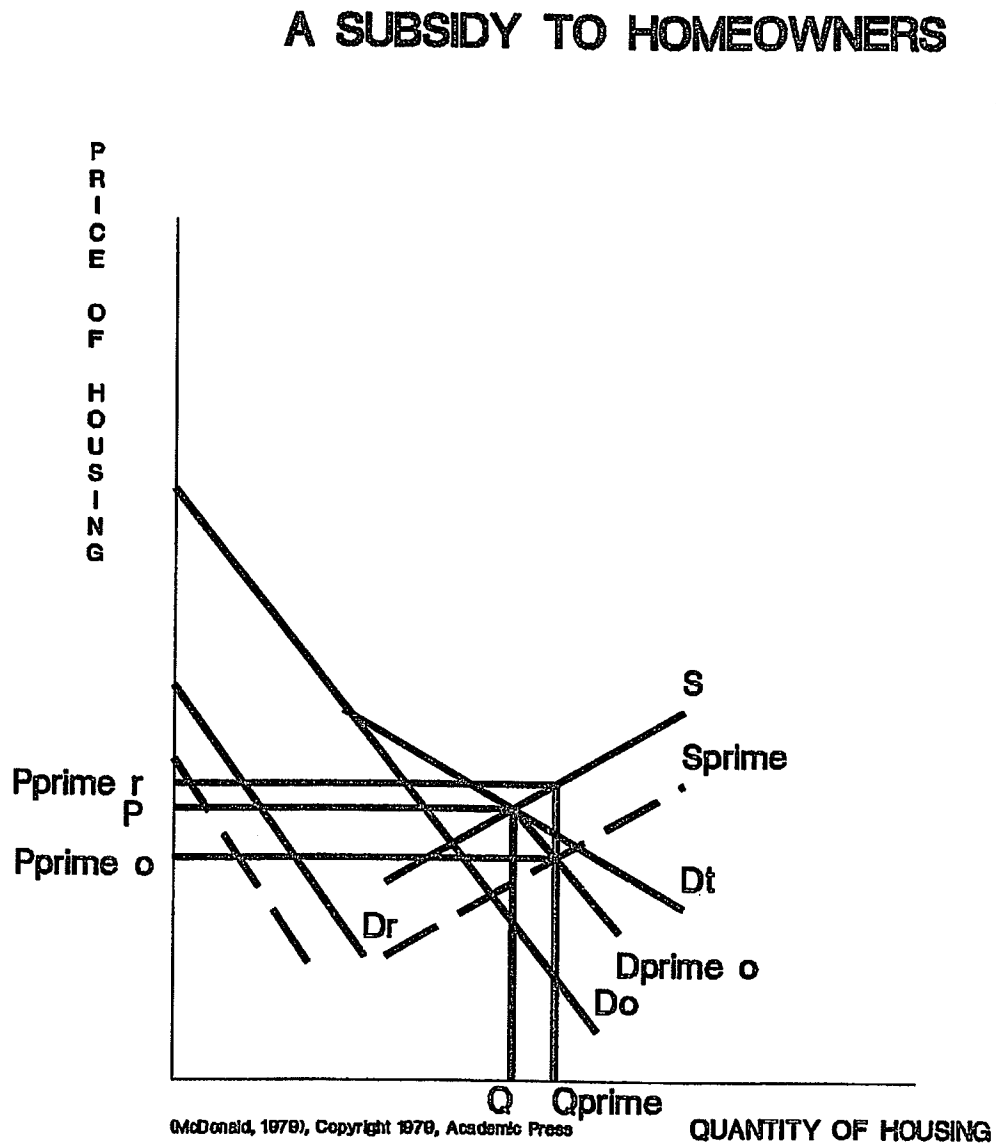
Woodward and Weicher took great care to emphasize the changed effect that the 1986 Tax Reform Act had upon the relative positions of owning versus renting, but the property tax omission question is an important one. It would be quite difficult to come up with a uniform national rate for property tax, which is why the simulation method of Pierce Hall which uses tens of thousands of IRS sample households convinces the reader more.

Another differential between owning and renting has been demonstrated by Sweeney (1974) who proved that the landlord tends to maintain property at a lower rate than the owner-occupant. This differential can be reflected in a benefit to the renter through repairs charged for in rents but not executed, or through lowered value of the rental property at time of sale due to deferred maintenance, or both.

The fact that the income elasticity for renters has been generally reported in a lower range than the income elasticity for owners (Goldberg and Chinloy, 1984, 367) indicates that care must be exercised in setting the cost of owning and renting as comparable on *a priori* grounds. Haurin and Lee (1989, 355-356) with a sample group of 1677 composed of 1283 renters, found income elasticity for owners from reduced form results to be 0.31.

In his presentation of the welfare economics treatment of the impact of a subsidy to homeowners on a housing market, McDonald (1979, 28) demonstrated that, in the presence of a subsidy to home owners and not renters, the price elasticity for renters drops to less than one, and the consumption of homeowners is greater than that of renters.

Figure 38. Theoretical Impact of a Subsidy to Homeowners.



In the case of a subsidy to homeowners, the Supply curve S for homeowners shifts down to S', bringing the demand for owners from  $D_o$  to  $D'o$  ( $D_t$  being the total demand for housing), and the cost to owners down from P to P'o, while causing the demand curve  $D_r$  for renters to shift also, bringing the price of rental housing up to P'r. The question of elasticity is key for this approach, otherwise we could not estimate the magnitude of the shifts in price and demand relative to the change in supply.

Woodward and Weicher argue against this traditional approach, holding that the landlord side of the equation under the existing tax law has been ignored, and that this landlord income side of the equation translates into a renter cost or savings. I disagree with their novel viewpoint.

Central to Woodward and Weicher's argument is their statement:

Given symmetric tax treatment of interest--taxable as income, deductible as an expense--the cost of debt and equity are equal. Given this basic irrelevance of the method of financing to the cost of housing, *any* profile of the alleged "tax benefit" of the deduction is misleading, because the benefit to owner-occupied housing lies in an entirely different part of the tax code, the absent part, i.e., the absence of taxes on imputed rent. The mortgage interest deduction is thus a device which ultimately improves the efficiency of taxes on the more affluent, and thus potentially benefits the poor also. (Woodward and Weicher, 1989, 311)

This statement merits a categorical answer.

The tax treatment of interest is only symmetric insofar as interest is taxed and deducted at the same time. Woodward and Weicher draw from Miller and Modigliani that macroeconomic debt and equity are equal (or more precisely, are without respect to the price of capital). They then syllogize: (A) The macroeconomic tax treatment of interest is symmetric. (B) Macroeconomic debt and equity are equal. (C) Taxing and deducting of interest are equal, a wash.

Their logic confuses:

- Symmetry with equality,
- Principal with interest,
- and macroeconomics with microeconomics.

For symmetry and equality to exist both interest earned and interest paid must be taxable and deductible at relatively the same time at the same rate, which in the short run, during which some individuals live out their lives, they are not. For equity, parenthetically, to exist in this arrangement in addition, this equality and symmetry must be achieved within the lifetime of most individuals, perhaps a gratuitous assumption.

One person's debt is indeed another's equity, and thus on a macroeconomic level they offset, but each person's interest is subject to different rates of arbitrage, and thus we have an economy wherein trade, profit, and loss are possible. To argue that, in the long run, interest doesn't matter, as Woodward and Weicher have done, is to argue from a theoretical macroeconomic stable state that the day to day microeconomic arbitrage of interest should not be taking place. The vantage point of their argument rests upon the height of Olympian abstraction, wherein the gods oversee the albeit entertaining but self-cancelling futility of human enterprise. It must be only because the economic gods are fooling us that we act. Woodward and Weicher use the language of economics to argue against the existence of an economy. Yet the economy, and the arbitrage, and the differentials in individual equity persist. Otherwise, there would be no economic activity whatsoever.

"Everybody's" wealth and poverty offsetting each other does not mean that each person's wealth and poverty is the same.

Woodward and Weicher's contention that the MID maximizes the taxation of the wealthy, presumably by allowing individuals to build wealth in the first place in order later to be



taxed upon it merits further study. But the fact that this wealth can be sheltered by the continual execution of increasingly "young" and larger mortgages for which interest is deductible they do not take into account, nor do they offset this strategy against their theory of lifetime taxation.

It is one thing to argue in theory that in the long run landlords, who also can deduct interest, will pass their costs and indirectly their savings on to renters. But the time lag between the savings and the pass-thru can sometimes be considerable. Economic actors may be indifferent about options in the long run but they are not indifferent about time, when the concern is their immediate need for shelter or income. A more complete picture, however, would have been gained if not only the costs of housing but the incomes of the owners and renters had been explicitly modeled by the authors, and offset against their method of discounting costs. Again, the tax simulation method of Pierce Hall has the advantage of capturing this offset.

Woodward and Weicher's (1989) defense of the MID on the basis that it offers a more fair distribution of taxation over a lifetime is weakened somewhat by the fact that, as the CBO (1981) pointed out, most of those who take advantage of the MID are not low-income owners. They point out that for first-time buyers, who annually account for about one of four home purchases, the MID is very important. Woodward and Weicher's lifetime tax distribution arguments are also more persuasive for this particular group.

While the MID might assist higher income individuals in distributing income more fairly over their lifetimes, this effect is not felt across the income spectrum, since a lower percentage of low income households take advantage of the MID than do higher income households.

Woodward and Weicher argue for treating incomes from rental housing and single family housing comparably. But the timing of the reception of the expected return on these housing

dollars is not the same in the short run, especially when investors are looking for current dollars. This fact is reflected in the differing elasticities reported for single family and rental housing as mentioned above, and for the different elasticities estimated by Harmon (1988) for long-run and short-run housing equations.

Woodward and Weicher's approach courts the possibility of assuming away a number of recent facts about housing markets. Also left out of the Woodward-Weicher analysis are answers to the questions:

1. Why, if costs of rental housing and single family housing are more comparable in the long run under the 1986 Tax Act than was previously assumed, did rental development fall significantly more than single family housing did after the Act? In other words, the housing markets themselves told us something about the current, not future value of rental housing after 1986.
2. Since Woodward and Weicher have raised the question of lifetime income, are the net worths of owning and renting households comparable in the long run? How do we account for the fact that owners possess an equity interest in their property in the long run while the renters do not, and why don't more renters choose to be buyers? Is the down payment the only reason? Do renters in the long run save amounts equal in the long run to the long run equity interests that homeowners accumulate? Do renters for roughly the same amount of money in the long run not choose to buy and thus greatly increase their access to further credit and convenience, as reflected in the treatment of homeowners versus renters in the granting of credit?

Significantly, Woodward and Weicher do not take up the benefits of modifying the MID as did Pierce Hall, whose simulation on actual IRS data helped capture possible market effects which the deductive method of Woodward and Weicher assumed away. Deductive methods

which assume perfect, immediate information and clearing markets on the one hand have difficulty persuading that markets have been wrong about the costs of owning and renting on the other.

Woodward and Weicher do succeed, however, in closing the door on the proposal for the outright abolition of the MID, especially in their argument that abolishing the MID would be tantamount to an immediate and substantial tax upon recent college graduates. One of their principal contributions is in pointing out that a mortgage instrument that would spread the interest over the period of the loan, the yet non-existent Price-Level Adjusted Mortgage (PLAM), instead of "loading" interest "up front" in the earlier years of the loan, as the current "self-amortizing" mortgage does, would also amount to a more fair distribution of lifetime income. The combination of the MID and the self-amortizing mortgage became much more of an economic factor when such mortgages were executed in great numbers after World War II, according to Weiss (Lehman, 1991). The PLAM, which has been under study by HUD (Woodward and Crowe, 1989) has been suggested by the authors as a much less painful way "to collect the revenue" (Woodward and Weicher, 1989, 313).

The forcible introduction of the PLAM, however, would also amount to a tax upon the young adult, yet not so extreme a tax as the abolition of the MID. Such introduction of the PLAM does not seem likely, however, except in the most extreme of budget-cutting scenarios. Such wide-spread use of the PLAM would be too fundamental a change in housing finance and would meet with much resistance from taxpayers whose lifetime plans have included large deductions during the first year of a mortgage.

At this point, however, Woodward and Weicher do not persuade that further changes in the MID might not be appropriate. Most interestingly, Woodward and Weicher themselves end their article with one of my "just war theory of economics" questions: **Have all other means been attempted?**

### 8.5.13 Conflicting MID Stories Wrap-Up

We have reviewed in detail the problems associated with the Mortgage Interest Deduction. While the MID provides some benefits to soften the impact of taxation on those first venturing into the home market, it does favor in a disproportionate way the wealthy, and it does discourage these households from investing in other items.

From the point of view of the United States government, however, there is one principal reason for trimming the MID: the budget deficit. Were there no deficit, there would be no serious discussion of the issue beyond expressed concern for inequities. The political force driving the process is that the government needs money to pay its debts. This force proceeds from necessity.

The Mortgage Interest Deduction has been capped at \$1 million in principal for housing and additional \$100,000 in principal for housing-secured consumer borrowing. This serves the public purpose primarily to guard against the flight of capital away from plant and equipment and into housing in the case of inflation, and raises a small amount of revenue for the Treasury, so small, indeed, that in the words of HUD Economists Susan Woodward and John Weicher (1989, 311) "the affected individuals might have been listed in the bill." Significantly, Woodward and Weicher went directly on to say, "the welfare cost of capping the deduction at a lower amount may well be small, only because it affects so few people."

### 8.6 What Means Should be Used to Reduce It?

Clearly, because of budgetary concerns, the MID is a revenue possibility. So here is one final look at the options.

#### 8.6.1 The PLAM Option.

The idea of a Price-Level Adjusted Mortgage as described above will take much more time for the public to be acquainted with it than remains within the time frame of budgetary

urgency, and without some empirical sense of its unanticipated effects. Until PLAM is introduced into the market, we cannot know if consumers will choose it, and it is unlikely to know how it can be effectively administered. There is little experiential base upon which to build a public policy constructed on a PLAM foundation.

#### 8.6.2 The Redistribution Option.

Not politically feasible. The McKinney Act assisted the homeless, and help for the homeless is supported by favorable public opinion polls, but there is little support for Downs' proposal, in effect, of trimming the MID and redistributing the funds to the poorly housed, not unless the poorly housed become a potent political force overnight. If the get-rid-of-the-MID-and-transfer-the-wealth-into-low-income-housing option did not pass in 1966-1968, there is no chance for it to pass today. There is no majority constituency today for redistributive housing policy beyond the minimal requirements of human charity and of political rent-seeking.

#### 8.6.3 The Stay Put Option.

Not feasible from the viewpoint of the budget deficit, but the MID made it through the 1990 Budget Agreement unscathed, fooling many.

#### 8.6.4 The Trim MID Option

The CBO's options for trimming the MID listed above, especially the \$20,000 cap on the maximum allowable annual deduction for a joint return and a \$12,000 cap for a single return, are more feasible. I refer to this option as the "12/20 cap." CBO (1990b, 358) maintained that "less than 2% of taxpayers who claimed home mortgage interest deductions in 1987 had deductions that exceeded these amounts." This suggestion has the advantage of appearing to treat the populace equally across the board, as opposed to more highly taxing areas with high proportions of expensive housing, such as areas of the Northeast, Texas, and California.

These states are powerful ones politically, but they also are already highly subsidized by federal programs as our maps in Figure 14 and Figure 15 showed earlier. The CBO's 12/20 cap proposal amounts to selectively taxing these states, and will run into political problems thereby since a number of middle-class homeowners will also be caught up in the taxation net. My proposal also selectively taxes these states, but is targeted specifically at more wealthy mortgagors, and is thus more politically defensible even if it impacts some states more than others.

Slow, incremental change in the MID would be ideal from an equity standpoint but would also be impractical. An incremental drop in the MID, say \$50,000 in principal deductible every two years until it became politically untenable, would have the advantage of maximizing the rational expectations effect: wealthy homebuyers would consider the MID to be ending some day, and would make other long-term plans for investment. The market would make the adjustments and the resulting gains in welfare would be less likely to be politically misdirected. The MID would no longer favor anyone except first-time homebuyers, and from this position it is unlikely it will ever be removed.

There are advantages in acting upon an intertemporal notion of Pareto equilibrium, wherein small incremental changes in welfare are enacted and market readjustments result, thereby minimizing welfare losses from unanticipated consequences and from political rent-seeking behavior. Is it possible that a series of incremental, less than Pareto efficient changes which minimized political rent-seeking behavior would in the long run be more efficient than a short-run Pareto efficient policy which was subject to rent-seeking pilferage?

Personally, I would prefer such an incremental strategy in this case, especially since it follows my model of harnessing rational expectations, letting the market do the work, minimizing rent-seeking, and bounding chaotic, unanticipated consequences. The landing from

such an incremental change is a softer one, and builders will have time to find other markets in which to build, contractors in which to work, and vendors in which to sell. I do propose "trusting the market" here.

The remark about rent-seeking is not a random one, for there is no assurance that, if the MID were abolished, that the resulting taxes would ever be used to redistribute an equivalent amount of housing. The "Hang onto Your Wallet" commonsense proposition warns us that the government would spend it substantially on something else. Completely dropping or chopping away a large chunk of the MID all at once would have dramatic and unpredictable effects. Dramatically shifting tax policy is a most inefficient way to conduct housing policy because of welfare losses and unanticipated consequences. To put the point in more economic and less commonsense language, there will be welfare losses from unanticipated consequences and from political rent seeking if a large amount of money is returned to the Treasury through hacking the MID.

This option is admittedly neither Pareto efficient nor optimal, but it is less inefficient than the present state of affairs which clearly favors the wealthy.

But I don't think our government is ready for this more moderate approach other than that very long term approach resulting from inflation pushing the nominal values of mortgages up beyond the \$1 million MID cap, which we for noninflationary reasons hope will take more than the present generation to accomplish. Establishing any kind of cap eventually promises to have that result, and preserves at least some intertemporal Pareto possibilities.

Planned smaller incremental budget changes are difficult and costly to administer, and nice round numbers, like \$100,000, are easier to swallow. Also, there are those in government who want to continue to collect their rent, and who will resist efforts to minimize rent-seeking. If they have a solid estimate of what revenues can be derived from taking a big chunk out of

the MID, they will be inclined to direct it to their own preferences, and will not go for slow, incremental change which increases public welfare. But again, it is the budget deficit, not concern for public equity, which is driving the "Trim the MID" engine. The studies of the inequities of the MID give only additional moral certainty to those making the difficult decisions concerning budget-cutting.

#### 8.7 My Proposal

The nagging complaints about the efficiency and equity of the Mortgage Interest Deduction remain. Therefore, I offer the following policy proposal, which on first glance might seem trivial but in its long-run effects it is not: *Trim the principal limits for the Mortgage Interest Deduction by \$100,000 in principal immediately.*

No doubt the foes of the MID will scoff at this amount, but the defenders of the MID will fight it as desperately as if it were a cut of \$500,000. But the relatively moderate amount, and the fact that it is primarily a small and resourceful population directly impacted, indicate, indeed, that the welfare loss will be small.

The other policy options do not presently have a chance of passage or implementation, besides the stand-pat option, which for reasons of equity and budget-cutting necessity due to domestic and international pressure is now untenable. That the stand-pat option survived the budget ax during the fall 1990 crisis is an indication of its strength, but economic necessity outweighs and outlasts political force in the long run.

I'm also guessing that cutting another \$100,000 from the principal amount whose interest is deductible under the MID will be more palatable to Congress, since a precedent in this capping of the MID has already been set in 1986 and the world did not end when it was capped. If it does not end with this next \$100,000, then a better case can be made to cut another \$100,000. Other approaches, such as those suggested by CBO, always threaten to have unanticipated effects.



As the size of the standard deduction grows, few but the first time buyers and the wealthy will claim the Mortgage Interest Deduction. Few first-time buyers are among those taking out million-dollar mortgages. The constituency for the MID will continue to shrink as the popularity of the standard deduction grows, thus leaving open a political opportunity to trim the MID.

#### 8.8 Have All Other Means Been Attempted?

So far, only the \$1.1 million principal cap on the MID has been enacted.

Changes in rules for the standard deduction have softened the blow of MID on renters. A miniscule amount, by budgetary standards, has been collected in tax due to the capping of the MID. Current low inflation has not tested the success of MID limit in keeping capital from fleeing from plant and equipment.

#### 8.9 Is Our Remedy Proportionate to the Problems Caused by the MID?

The question of the loss of income on the part of renters due to the subsidy to homeowners remains. Unfortunately, our remedy is disproportionate due to the primacy of budget cutting over equity issues. The preferred equity approach would be a slow descent of the MID, but this is not likely.

#### 8.10 Will We Be Better Off Afterward?

We turn one more time to the welfare economics approach.

In the case of a tax to luxury homeowners, the Figure 39 shifts back toward its original positions. The supply curve for homeowners shifts toward S from S', and the demand curve for owners shifts back toward  $D_o$  from  $D'o$  ( $D_t$  being the total demand for housing). The luxury homeowners remain predominantly homeowners, but absorb a capital loss, as do all homeowners (the welfare economics approach takes into consideration the price paid by homeowners to rent from themselves, net of federal tax), as the price of housing travels from  $P'o$  back to P.

Although the transition to this state of affairs is not a simple one, Poterba's rational expectations approach which we discussed is congruent with the welfare economics approach. The value of the luxury housing ultimately goes down, especially in the presence of inflation, provided that the Mortgage Interest Deduction for that property is cancelled (Poterba, 1984, 748). Following Poterba's logic through, the owner of the present luxury home pays more tax, and potentially loses more capital in addition to the tax since the value of the home goes down after the tax goes up.

There would be more danger of this possibility, still uncertain, were we to completely cut the MID. But remember, we're not cancelling the MID, but reducing it by 10% in that case of a household holding \$1 million in mortgage principal. This moderate approach addresses Poterba's principal concerns of a cataclysmic rational expectations effect, and amounts to a luxury tax for housing overconsumption. There will be some welfare loss, especially among the makers of luxury home fixtures and appliances and among luxury home builders and their subcontractors, and for those who resell luxury homes if they have no advance warning, which is not likely. Million dollar vacation condominiums in resort areas would also drop in value somewhat, but they have already dropped recently, and they are few. Moreover the current housing recession has already imposed whatever substantial losses upon these vendors, builders, and trades as are likely to occur, and has driven most of those out of the market who have not already learned to survive housing cycles. The resulting additional losses in welfare among housing vendors, should a small increment of the MID be trimmed, would therefore be less than if no recession had occurred in housing, since housing vendors are already in their recessionary mode. To trim the MID slightly during a housing recession and thereby actually harm a smaller number of businesses, who have already executed layoffs and reduced inventories, and who are already better positioned to make other plans, might be better than

catching an industry unawares by imposing a tax upon it which might devalue its capital more than it would had it had time to reposition.

I do not think this particular line of reasoning will persuade legislators, who would not want to be accused of worsening the recession in housing to any degree under any set of circumstances. Nonetheless there is also pressure during a housing expansion not to "end" it by taxation, so this argument plays both ways. Ultimately, this question will be governed by budgetary necessity and political influence, but questions of economic efficiency and moral certainty can have some influence. We've tried to travel down all these major paths.

#### 8.11 Chapter Summary

We reviewed the problems posed by the Mortgage Interest Deduction from an equity and a technical viewpoint, and attempted the "thought-experiment" of applying my "just war theory of economics" approach to this "large" public problem, and revealing the personal reasoning processes underlying a policy recommendation. By examining each "story" of the MID, we moved "toward, away, and against" the complex sense of certainty called common sense.

A number of commonsense assumptions associated with the Know-Do Matrix were also addressed. Pierce Hall's simulation approach was found to more adequately address concerns raised by the possibility of akratic irrationalities. The rational expectations approach to housing price was considered, as was the question of chaos in single family and multi-unit housing markets. The uncertainties raised by unanswered quantitative questions pertaining to elasticity in these areas led us to conclude that some gradual incremental approach might "get us on the right side" of rational expectations common sense, might allow the market itself to move to long-term equilibrium, might promise to reduce opportunities for political rent-seeking behavior, and might limit the range of chaotic, unanticipated consequences. Through this dialogue

between qualitative and quantitative inquiry, we attempted to situate the art (and ultimately, perhaps, the science) of public problem solving within a wider cultural context. The purpose of this exercise in formalizing and applying common sense was to arrive at a suggestion that actually has some possibility of being enacted, as opposed to a theoretical nicety to be filed away. Because of all the groundwork laid, in the end we were able to "abduct" our way to our preferred option without apology.

Thinking about incremental change brought us to consider the intertemporal model of Pareto efficiency, which might compensate for a potential diversion of welfare due to political rent-seeking behavior. By keeping the increments of policy change small, the immediate effects are also small, giving those who stand to lose something under the policy time to redirect their investments.

I also argue for a smaller incremental cut because to a certain degree, what government cannot quantify, it cannot misappropriate. If the government estimates a tax's impact will be minimal, it cannot as easily, and as is typically the case, immediately spend in the short run those benefits it anticipates to recoup in the long run. Although some spenders will certainly try to misappropriate in any case, the Arrow choice paradox might produce a misappropriation effect without anyone in particular trying to misappropriate. That is why it is appropriate on matters of long-standing policy to make small, possible moves in the right direction, in this case, the trimming of the MID.

The key to an intertemporal Pareto movement is to harness the rational expectations effect of the perception that the MID will no longer be permanent, let the free market make the equilibrium adjustments, avoid rent-seeking possibilities, and keep the possibilities for chaotic and unpredictable fluctuations within a smaller range. This approach takes into account the economic complexities for which the commonsense propositions of the Know-Do Matrix serve as proxies.

Yes, this is incrementalism in this case. But it is no longer blind incrementalism. We attempt to harness rational expectations, bound chaos and akrasia, and "make dumb luck smart luck" by looping information back into the market. Such a project also exercises prudent judgment in the attempt to address a clear inequity in our tax and housing policy.

This approach also addresses another problem: the lack of accurate estimates of the elasticities of different segments of the housing market and the behavior of these elasticities over time. You can be assured that if the policy of slowly ratcheting down the MID were enacted, there would be a flurry of research estimating the effects on each descending strata of the housing market in turn, with a political impasse being reached at some point, where both the research and the ratcheting would diminish.

In the end, my guess is that the MID would always remain for first-time buyers on their first mortgages. My suggestion, provided our country can afford to avoid drastic budgetary moves, is to move toward that point over the course of two decades, and for our government to withstand the temptation to spend away in two years whatever increased revenue it estimates to receive in twenty. If the change is slow and steady enough, the market will make its own relatively efficient adjustments, and each of our respective oxen will be prodded, not gored. And more builders could go back into the apartment business, where there again would be money to be made.

Throughout this discussion, we have tempered our analysis of what theory tells us is correct with what we think would work. We have tried to keep clear of the likelihood of unanticipated consequences. We have proposed taking a meaningful but acceptable cut in the Mortgage Interest Deduction now which would still leave the door open for meaningful but acceptable cuts later. One cannot change a policy of almost 80 years standing, affecting at one time or other the lives of almost 60% of the nation's households, overnight.

### 8.12 And it Boils Down to...

We can now render what we have discussed down to a few key points for a later "convincing others" presentation. This presentation, following the approach outlined herein:

1. has allowed a public problem solver to keep something of an open mind while considering aspects of a complex problem involving the viewpoints of partisans;
2. has kept us from losing important "pieces of the puzzle" for ideological or professional reasons;
3. has situated our familiar scientific inquiry within a framework which would address the common sense of citizens, and thus persuade them better of the usefulness of scientific inquiry concerning public problems;
4. would result in final arguments to be conducted in the language of the citizen, in this case, American English, as opposed to technical language.
5. would not just invent another "model" but actually test this model in an inquiry, and thereby learn by self-appraisal and from academic colleagues what modifications would improve the model.

In this case the author recommended that the ceiling for mortgage principal for deductible interest be lowered from \$1.1 million to \$1 million, and argued for this option, even though considerably less than \$1 billion annually would be returned to the Treasury therefrom, as an option which would:

- minimize unpredictable side effects from a larger cut,
- continue the process of cutting the MID to continue to address the inequities related thereto,
- minimize public backlash against cutting the MID (avoiding "killing the goose that laid the Golden Egg" and closing off a policy option for decades as was done when Wisconsin

taxed imputed rent early in this century) thereby not closing off a future option of cutting the MID further,

- minimize Congressional hesitancy to cut the MID by continuing to cut in a manner for which they established a precedent, and from which political repercussions have been minimal,
- alter the long-term plans of homebuyers and investors by strengthening the perception that the MID is no longer permanent,
- reduce transaction costs related to cutting the MID in smaller increments, which would be administratively cumbersome,
- minimize political rent-seeking behavior by politicking over the revenues if the revenues generated were larger, thereby minimizing the diversion of an increase of welfare away from renters,
- allow housing markets to make adjustments themselves along "invisible hand" lines, increasing the possibility for markets more favorable to renting and investment in plant and equipment.

It is not likely that we would have arrived at these arguments had not something similar to commonsense judgment been exercised behind the scenes in policy analysis. This work has "turned up the volume" on the commonsense background music of policy analysis in order to better understand it, to harness its strengths, and to minimize its weaknesses. It is up to each planner or policy analyst to judge for him or herself to what level and in what circumstances to turn this background music down or up, so that citizens can not only hear but understand the reason in their arguments.

## CONCLUSION

Each team of policy analysts, after their scientific inquiry into a public question, at some point considers the questions:

- Will people "buy" our proposal?
- How can we harness market forces?
- How can we reduce the chance of the unanticipated?

and similar questions. What I have done is try to make the links between scientific inquiry in public policy and policy practice reflected by such questions more explicit. This has been done by considering the relationship between public policy themes and their "background music." It is the background music which enhances a theme and makes it memorable.

I began this exercise by looking at a policy problem which has been thoroughly addressed by the scholarly community, yet this scholarly inquiry has had only partial effect on the resultant public policy. This inquiry has outlined a method of searching for a public solution to a problem which, by juxtaposing scientific arguments with differing propositions of common sense and with stories composed of history and commonsense propositions about history, reduces the proposed policy options down to those which stand a better chance of being approved and of working if approved. The two razors, Occam's and John or Jane Q Public's, are needed for this.

To construct this model necessarily took quite some effort, for in effect we were reproducing the "expert knowledge" of a housing analyst. But once the model has been constructed, to use it becomes quick and intuitive.



This intuition, moreover, must be informed by an appreciation of the human side of quantitative science. These are, after all, human beings who move those curves back and forth across the page in course of both our market analysis and our own market behavior, and the curves we draw upon the page are but a few of those thousands which interact without our knowledge. Welfare economics can inform us which direction we might move, but we must draw upon our own wisdom, in all its forms, to get there. That wisdom must stand in the place of all the curves we are presently not capable of seeing or of drawing. In this I reecho W. Edwards Deming's desire that we understand variation which we can measure, but also how we can learn to proceed when some of our most important concerns are things which we cannot measure. Both these tasks take continual efforts at study and improvement. To these ends I have tried to make explicit a dialogue among scientific and commonsense forms of reasoning.

In substantive national policy issues such as housing, my approach argues against policy recommendations being developed by specialists who cover agriculture one day, housing the next, unless they know the policy history and context of each, or else they are seeking only technical answers. Their technical answers may be correct, but they may be framed in such a way that the policy proposals which might spring from these answers might never see the light of day. I argue that for a housing analyst to make a difference, they must be able to "write in their own minds" the contents of a work like this. There are many ways to be quick. But the only way to be quick and effective is to be prepared. This takes much work.

My reader will say, if your answer was "incrementalism" in this case then why was it necessary to put us through several hundred pages of thought? My point is that what we know and do before, during, and after we do our welfare calculations and draw our pictures makes quite a bit of difference. The policy directions of harnessing rational expectations,

informing dumb luck, bounding akrasia and chaos provide us a map for our next move in policy, however incremental it might be. This is the bonus of the approach I outline here: you don't just get an answer, you get a map with clues about what to do next. Policy opportunities can thus be seized as they arrive.

In this work I have tried to travel as far as my present ability and time allowed me. The point of the exercise was to make an informed judgment about a public question, and thereby to develop tools for making informed public judgments. A final presentation chapter, displaying more graphs and tables which summarize my proposal on the MID, will have to wait for the next edition. I would also have liked to have traveled farther into the quantitative questions. Questions about rational expectations, chaos, elasticity, intertemporal Pareto efficiency, and philosophical precision remain. But these questions continue to vex many thinkers.

It is difficult to tell whether the question of deterministic chaos will shed light on housing cycles. Chaos systems might actually describe the underlying model which econometric methods summarize through linear systems, or it might be yet another blocked pathway. To an understanding of bounded rationality one could add bounded randomness. The search in policy analysis would then be for thresholds of chaos, for "attractors". When seen in this light, an even stronger argument against the rational planning model arises. In the short run, expectations, like mortgage rates' recent anticipation of prime rate rises, could be part of a prelude to chaotic cycles that display a limited rationality. But I prefer to be cautious about these things. It is always easy to conclude "nothing works" and to make one's own rules.

Which brings us to an important conclusion. Each public inquiry should spend at least some time rethinking the assumptions of a particular simplified model. Controversies such as those surrounding housing market elasticities have gone on for the better part of three decades, with each article chaining on to the end of the previous one. We must decompose

housing markets and policies into long-term scientific questions and pursue them with the goal of answering the questions implicit in them. For this we need to define the task, to make a "map and a calendar" for planning and policy analysis in the housing sector.

Another way of thinking of our familiar graph of welfare economics is that it is similar to a CT-SCAN, and provides a snapshot in time and in two dimensions of the relationships of those forces which we deem important and for which we have, from past data, inferred a future pathway. But at various steps along the way it behooves us to check this pathway against those things which we also know to be true, and those things which we presently observe.

As the computer visualization Renaissance continues, the ability of technicians to make their cases will depend more and more on the visual and graphic arts--and these through computer holography will extend into three dimensions. Science will of necessity have to learn the language and structure of perception-based common sense if it is to avoid being swept aside in the new visual technology of the millennial metropolis. The planner especially, because of the historical links with both geography and design, is poised like the graphic and plastic arts to make a positive contribution, provided our accumulated common sense is not drowned out by glitzy video-bites.

In this context an opportunity appears for the classical approach to scientific inference which we have reinterpreted as that of "overlapping certainties"--the "as-if" reasoning outlined earlier. The pool shark plays "as-if" he or she knows the laws of physics. Once that principle has been firmly established, then whatever model which "works", based upon whatever assumptions to predict the behavior of the actors, becomes acceptable. But which sets of assumptions become unacceptable? Some are those which conclusively violate the common sense of the citizens to be persuaded, but some common sense is clearly ignorance.

Herbert Simon, whose Nobel laurels followed those of Milton Friedman's by two years, used the pulpit of his Nobel address to castigate what I call Friedman's "as-if" approach as being rife with numerous fallacies, singling out Friedman's 1952 essay specifically (Simon, 1982). This Simon-Friedman debate echoes the debates between the rationalists and empiricists of yore, and these are not settled within the positivist school by any means. Planners and policy analysts must go on making recommendations within this uncertain intellectual context, and must mediate their scientific findings with commonsense methods.

By using the "three certainties" the question of which assumptions are untenable is drawn into closer focus. Just as Milton Friedman argued that economic assumptions which violate common sense can still have scientific worth, we have considered the question of effective scientific knowledge which can never be implemented because of the lack of connection with the common sense of citizens. Science can be true, but it also can be useless. By considering the question of the relationship between common sense and science, of the citizen and the scientist, a better picture of the whole of inquiry can come clear for both.

Public action is mediated by complex senses of certainty--differing common senses--shared by citizens. We will make little progress in solving our public problems, especially those of housing policy, until we better understand these complex senses of certainty, and learn how to change them for the better. This takes continual effort on the part of all concerned citizens of good will.

We cannot explain each wave in the ocean, although we can predict with certainty that somewhere there will be a sand bar. Because the world turns, we convince ourselves we understand the motions of the stars. Public actions are sometimes perceived on such a grand scale. Our interventions in housing markets over the past generations have benefitted many millions of citizens. But millions remain who, ideology aside, the "better angels of our nature,"

as Lincoln called them, we would prefer to see well housed. Housing policy still remains a fog of idealism and ambition, of conflicting certainties, of FHA-owned golf courses and booms, overbuilding, underbuilding and dreams of one's own home that drive citizens miles from nowhere to have one's own place.

To such a market of interacting citizens we must continue to direct our attention, to build with our informed judgment "generic" tools which defend the accumulated wisdom of our culture against political spoilage, and to act in such a way that the welfare of all of our citizens is enhanced. To do this, we must not be afraid to occasionally tip the scales of necessity:

So in point of freedom of judgment, the rationality of a thoughtful man is poles apart from the necessity felt by a man in want or the calculus of pleasure applied by one who is ruled by desire. Reason weighs a thing according to its intrinsic place in the great scale of being; necessity, however, calculates what is must obtain and for what reason. Reason considers what will appear to the inner light of the mind as being true; but pleasure keeps in view the question what pleasant thing will gratify the physical senses. In the case of rational creatures, however, a good will and a right love add so much weight to the scales. . . . (Augustine, [426] 1968, 491)

It is only within that complex sense of certainty, the common sense of citizens, that we can find the "good will" and "right love" necessary to address wisely our wicked public problems, and to marry our technical knowledge with the accumulated wisdom we so dearly need.

**APPENDICES**

## Appendix A

### PARTIAL DATA APPENDIX

The following statistics explore the relationships among single and multi-family housing markets, attempt to replicate Poterba (1984), explore the slopes of annual housing totals in phase space, and attempt to reconstruct the missing single versus multi-family housing statistics for the years 1945-1958.

The first group of printouts are investigations of the relationships among single and multi-family housing totals.

The second group attempt to replicate Poterba (1984).

The third group calculate the slopes of annual housing totals in phase space.

The final models attempt to project missing disaggregated values of single versus multi-unit housing for the years 1945-1958.

## Appendix A (continued)

The SAS System

15:10 Monday, August 26, 1991

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
YR	YEAR	100	1938.50	29.0114920	1889.00	1988.00
T	CURRENT YEAR HOUSING PRODUCTION	100	886810.00	618689.96	93000.00	2378500.00
TPLUS1	YEAR AHEAD HOUSING PRODUCTION	100	897133.00	618119.68	93000.00	2378500.00
SUBS	SUBSIDIZED HOUSING STARTS	51	98725.49	107846.02	1000.00	441000.00
PCTSURS	PERCENT SUBSIDIZED UNITS STARTED	51	0.0713193	0.0627787	0.0023659	0.2933969
SINGL	SINGLE FAMILY HOME STARTS	75	580933.33	400026.26	76000.00	1451000.00
MULTI	STARTS IN STRUCTURES > 1 UNIT	75	304613.33	249473.64	16000.00	1069500.00
PCTSIINGL	PERCENT OF STARTS SINGLE FAMILY	75	0.6818686	0.0862409	0.5406667	0.8805970
PCTMULTI	PERCENT OF STARTS MULTI-UNIT BLDGS	75	0.3181314	0.0862409	0.1194030	0.4593333



Appendix A (continued)

15:10 Monday, August 26, 1991

The SAS System

OBS	VR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI
1	1889	342000	328000	.	.	.	.	.	.
2	1890	328000	298000	.	.	.	.	.	.
3	1891	298000	381000	.	.	.	.	.	.
4	1892	381000	267000	.	.	.	.	.	.
5	1893	267000	265000	.	.	.	.	.	.
6	1894	265000	309000	.	.	.	.	.	.
7	1895	309000	257000	.	.	.	.	.	.
8	1896	257000	292000	.	.	.	.	.	.
9	1897	292000	262000	.	.	.	.	.	.
10	1898	262000	282000	.	.	.	.	.	.
11	1899	282000	189000	.	.	.	.	.	.
12	1900	189000	275000	.	.	.	.	.	.
13	1901	275000	240000	.	.	.	.	.	.
14	1902	240000	253000	.	.	.	.	.	.
15	1903	253000	315000	.	.	.	.	.	.
16	1904	315000	507000	.	.	.	.	.	.
17	1905	507000	487000	.	.	.	.	.	.
18	1906	487000	432000	.	.	.	.	.	.
19	1907	432000	416000	.	.	.	.	.	.
20	1908	416000	492000	.	.	.	.	.	.
21	1909	492000	387000	.	.	.	.	.	.
22	1910	387000	395000	.	.	.	.	.	.
23	1911	395000	426000	.	.	.	.	.	.
24	1912	426000	421000	.	.	.	.	.	.
25	1913	421000	433000	.	.	.	.	.	.
26	1914	433000	437000	.	.	.	.	.	.
27	1915	437000	240000	.	.	.	.	.	.
28	1916	437000	118000	.	.	.	.	.	.
29	1917	240000	315000	.	.	.	.	.	.
30	1918	118000	247000	.	.	.	.	.	.
31	1919	315000	449000	.	.	.	.	.	.
32	1920	247000	716000	.	.	.	.	.	.
33	1921	449000	810000	.	.	.	.	.	.
34	1922	716000	893000	.	.	.	.	.	.
35	1923	810000	849000	.	.	.	.	.	.
36	1924	893000	937000	.	.	.	.	.	.
37	1925	937000	849000	.	.	.	.	.	.
38	1926	849000	810000	.	.	.	.	.	.
39	1927	810000	753000	.	.	.	.	.	.
40	1928	753000	509000	.	.	.	.	.	.
41	1929	509000	330000	.	.	.	.	.	.
42	1930	330000	254000	.	.	.	.	.	.
43	1931	254000	134000	.	.	.	.	.	.
44	1932	134000	93000	.	.	.	.	.	.
45	1933	93000	126000	.	.	.	.	.	.
46	1934	126000	221000	.	.	.	.	.	.
47	1935	221000	319000	.	.	.	.	.	.
48	1936	319000	336000	5000	0.02262	183000	17000	0.86508	0.13492
49	1937	336000	406000	15000	0.04702	244000	38000	0.82805	0.17195
50	1938	406000	515000	4000	0.01190	267000	75000	0.76489	0.23511
51	1939	515000	603000	7000	0.01724	317000	89000	0.78079	0.21921
				57000	0.11068	399000	116000	0.77476	0.22524

## Appendix A (continued)

52	1940	603000	706000	73000	0.12106	486000	117000	0.80597	0.19403
53	1941	706000	356000	87000	0.12323	606000	102000	0.85552	0.14448
54	1942	356000	191000	59000	0.15449	293000	63000	0.82303	0.17697
55	1943	191000	142000	7000	0.03665	144000	47000	0.75393	0.24607
56	1944	142000	326000	3000	0.02113	118000	24000	0.83099	0.16901

Appendix A (continued)

15:10 Monday, August 26, 1991

The SAS System

OBS	YR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI
57	1945	326000	1023000	1000	0.00307	.	.	.	.
58	1946	1023000	1268000	8000	0.00782	.	.	.	.
59	1947	1268000	1362000	3000	0.00237	.	.	.	.
60	1948	1362000	1466000	18000	0.01322	.	.	.	.
61	1949	1466000	1952000	36000	0.02456	.	.	.	.
62	1950	1952000	1491000	44000	0.02254	.	.	.	.
63	1951	1491000	1504000	71000	0.04762	.	.	.	.
64	1952	1504000	1438000	59000	0.03923	.	.	.	.
65	1953	1438000	1551000	35000	0.02434	.	.	.	.
66	1954	1551000	1646000	19000	0.01225	.	.	.	.
67	1955	1646000	1349000	19000	0.01154	.	.	.	.
68	1956	1349000	1224000	21000	0.01557	.	.	.	.
69	1957	1224000	1382000	47000	0.03840	.	.	.	.
70	1958	1382000	1554000	62000	0.04486	.	.	.	.
71	1959	1554000	1296000	34000	0.02188	1251000	303000	0.80502	0.19498
72	1960	1296000	1365000	42000	0.03241	1009000	287000	0.77855	0.22145
73	1961	1365000	1492000	36000	0.02637	989000	376000	0.72454	0.27546
74	1962	1492000	1635000	39000	0.02614	996000	496000	0.66756	0.33244
75	1963	1635000	1561000	48000	0.02936	1013000	622000	0.61957	0.38043
76	1964	1561000	1510000	55000	0.03523	972000	589000	0.62268	0.37732
77	1965	1510000	1196000	64000	0.04238	965000	545000	0.63907	0.36093
78	1966	1196000	1322000	72000	0.06020	780000	416000	0.65217	0.34783
79	1967	1322000	1545000	91000	0.06884	845000	477000	0.63918	0.36082
80	1968	1545000	1500000	163000	0.10550	900000	645000	0.58252	0.41748
81	1969	1500000	1469000	197000	0.13133	811000	689000	0.54067	0.45933
82	1970	1469000	2084500	431000	0.29340	813000	656000	0.55344	0.44656
83	1971	2084500	2378500	441000	0.21156	1151000	933500	0.55217	0.44783
84	1972	2378500	2057500	388000	0.16313	1309000	1069500	0.55035	0.44965
85	1973	2057500	1352500	290000	0.14095	1132000	925500	0.55018	0.44982
86	1974	1352500	1171400	142000	0.10499	888000	464500	0.65656	0.34344
87	1975	1171400	1547600	111000	0.09476	892000	279400	0.76148	0.23852
88	1976	1547600	2001700	118000	0.07625	1162000	385600	0.75084	0.24916
89	1977	2001700	2036100	191000	0.09542	1451000	550700	0.72488	0.27512
90	1978	2036100	1760000	232000	0.11394	1433000	603100	0.70380	0.29620
91	1979	1760000	1312600	237000	0.13466	1194000	566000	0.67841	0.32159
92	1980	1312600	1100300	208000	0.15846	852000	460600	0.64909	0.35091
93	1981	1100300	1072100	178000	0.16177	705000	395300	0.64073	0.35927
94	1982	1072100	1712500	178000	0.16603	663000	409100	0.61841	0.38159
95	1983	1712500	1755800	124000	0.07241	1068000	644500	0.62365	0.37635
96	1984	1755800	1745000	99000	0.05638	1084000	671800	0.61738	0.38262
97	1985	1745000	1807100	70000	0.04011	1072000	673000	0.61433	0.38567
98	1986	1807100	1622700	.	.	1179000	628100	0.65243	0.34757
99	1987	1622700	1488100	.	.	1146000	476700	0.70623	0.29377
100	1988	1488100	1374300	.	.	1081000	407100	0.72643	0.27357

Appendix A (continued)

15:10 Monday, August 26, 1991

ALL YEARS AVAILABLE

Model: MODEL1  
 Dependent Variable: SINGL SINGLE FAMILY HOME STARTS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob > F
Model	1	1.1379855E13	1.1379855E13	1799.286	0.0001
Error	73	461699607564	6324652158.4		
C Total	74	1.1841555E13			

Root MSE 79527.68171 R-square 0.9610  
 Dep Mean 580933.33333 Adj R-sq 0.9605  
 C.V. 13.68964

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	28654	15932.592620	1.798	0.0762	Intercept
T	1	0.623659	0.01470271	42.418	0.0001	CURRENT YEAR HOUSING PRODUCTION

Appendix A (continued)

15:10 Monday, August 26, 1991

ALL YEARS AVAILABLE

Durbin-Watson D 0.432  
 (For Number of Obs.) 75  
 1st Order Autocorrelation 0.766

Obs	Dep Var SINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2-1-0 1 2	Cook's D
1	123000	146525	13755.34	-23525.4	78329.07	-0.300		0.001
2	177000	200160	12841.72	-23160.1	78484.03	-0.295		0.001
3	171000	178332	13206.56	-7332.0	78423.46	-0.093		0.000
4	175000	186440	13069.87	-11439.6	78446.36	-0.146		0.000
5	207000	225106	12437.73	-18106.5	78569.06	-0.231		0.001
6	336000	344849	10738.03	-8849.1	78799.41	-0.112		0.000
7	316000	32376	10893.35	-16375.9	78778.09	-0.208		0.000
8	291000	298075	11348.82	-7074.6	78713.76	-0.090		0.000
9	286000	288096	11488.63	-2096.1	78693.48	-0.027		0.000
10	328000	335494	10853.98	-7494.2	78783.52	-0.095		0.000
11	251000	270010	11749.78	-19010.0	78654.91	-0.242		0.001
12	249000	274999	11676.77	-25999.2	78665.78	-0.331		0.001
13	258000	294333	11400.88	-36332.7	78706.24	-0.462		0.002
14	264000	291214	11444.60	-27214.4	78699.89	-0.346		0.001
15	263000	291214	11444.60	-28214.4	78699.89	-0.359		0.001
16	262000	286998	11340.19	-36698.3	78715.01	-0.466		0.002
17	267000	301193	11305.79	-34192.9	78719.96	-0.434		0.002
18	166000	178332	13206.56	-12332.0	78423.46	-0.157		0.000
19	91000.0	102246	14549.24	-11245.6	78185.50	-0.144		0.000
20	239000	225106	12437.73	-13893.5	78549.06	-0.177		0.000
21	202000	182698	13132.79	19302.4	78435.85	0.246		0.001
22	316000	308677	11203.79	7323.1	78734.54	0.093		0.000
23	437000	475194	9515.394	-38193.9	78956.38	-0.484		0.002
24	513000	571861	9185.556	-58861.2	78995.43	-0.745	*	0.004
25	534000	585582	9183.720	-51581.7	78995.64	-0.653	*	0.003
26	573000	613023	9214.173	-40022.7	78992.10	-0.507	*	0.002
27	491000	558141	9198.773	-67140.7	78993.89	-0.850	**	0.005
28	454000	533818	9249.997	-79817.9	78987.91	-1.011	**	0.007
29	436000	498269	9387.572	-62269.3	78971.68	-0.789	*	0.004
30	316000	346096	10722.82	-30096.4	78601.48	-0.382		0.001
31	227000	234461	12290.06	-7461.4	78572.30	-0.095		0.000
32	187000	187063	13059.41	-63.2567	78448.10	-0.001		0.000
33	118000	112224	14367.54	5775.9	78219.09	0.074		0.000
34	76000.0	86654.1	14836.15	-10654.1	78131.56	-0.136		0.000
35	109000	107235	14458.20	1765.2	78202.38	0.023		0.000
36	243000	166482	13408.73	16517.5	78389.15	0.211		0.001
37	184000	227601	12398.14	16398.9	78555.32	0.209		0.001
38	267000	238203	12231.61	28796.7	78281.42	0.366		0.002
39	317000	281860	11577.57	35140.5	78680.44	0.447		0.002
40	399000	349838	10677.54	49161.6	78807.63	0.624	*	0.004
41	486000	404720	10078.99	81279.6	78886.41	1.030	**	0.009
42	604000	468957	9554.965	135043	78951.60	1.710	***	0.021
43	293000	250677	12039.39	42323.5	78611.10	0.538	*	0.003
44	144000	147773	13733.46	-3772.7	78332.91	-0.048		0.000
45	118000	117213	14277.28	786.6	78235.62	0.010		0.000

## Appendix A (continued)

46	1251000	997821	13450.64	253179	78381.96	3.230	*****	0.154
47	1009000	836916	10988.50	172084	78764.87	2.185	*****	0.046
48	989000	879949	11576.74	109051	78680.57	1.386	***	0.021
49	960000	959154	12799.72	36846.3	78490.89	0.469	**	0.003
50	1013000	1048337	14343.88	-35337.0	78223.43	-0.452		0.003

Appendix A (continued)

15:10 Monday, August 26, 1991

ALL YEARS AVAILABLE

Obs	Dep Var SINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2	-1	0	1	2	Cook's D
51	972000	1002186	13526.03	-30186.2	78368.99	-0.385						0.002
52	965000	970380	12985.47	-5379.6	78460.37	-0.069						0.000
53	780000	774551	10254.92	5449.5	78863.74	0.069						0.000
54	845000	853132	11203.00	-8131.6	78734.65	-0.103						0.000
55	900000	992208	13354.26	-92207.7	78398.44	-1.176	**					0.020
56	811000	964143	12881.93	-153143	78477.44	-1.951	***					0.051
57	813000	944810	12566.49	-131810	78528.56	-1.678	***					0.036
58	1151000	1328672	19876.38	-177672	77003.78	-2.307	****					0.177
59	1309000	1512028	23793.94	-203028	75884.78	-2.675	****					0.352
60	1132000	1311833	19525.17	-179833	77093.58	-2.333	****					0.175
61	888000	872153	11465.75	15846.8	78696.81	0.201						0.000
62	892000	759208	10099.13	132792	78883.84	1.683				***		0.023
63	1162000	993829	13382.04	168171	78393.71	2.145				***		0.067
64	1451000	1277033	18805.12	173967	77272.37	2.251				***		0.150
65	1433000	1298487	19248.08	134513	77163.23	1.743				***		0.095
66	1194000	1126294	15799.59	67705.5	77942.45	0.869				*		0.016
67	852000	847269	11124.41	4730.8	78745.79	0.060						0.000
68	705000	714866	9710.728	-9866.3	78932.59	-0.125						0.000
69	663000	697279	9583.938	-34279.1	78948.09	-0.434						0.001
70	1068000	1096671	15236.69	-28670.6	78054.44	-0.367						0.003
71	1084000	1123675	15749.38	-39675.1	77952.61	-0.509			*			0.005
72	1072000	1116940	15620.65	-44939.6	77978.51	-0.576			*			0.007
73	1179000	1155669	16368.05	23331.2	77825.05	0.300						0.002
74	1146000	1040666	14205.43	105334	78248.69	1.346				**		0.030
75	1081000	956721	12759.84	124279	78497.38	1.583				***		0.033

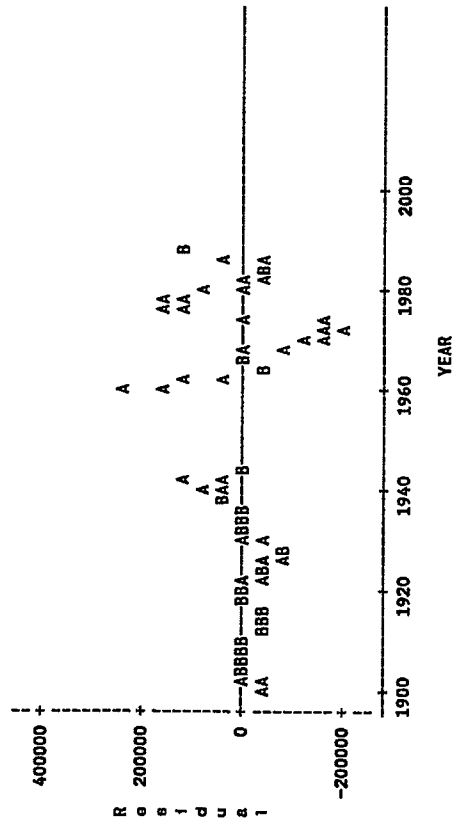
Sum of Residuals 0  
 Sum of Squared Residuals 461699607564  
 Predicted Resid SS (Press) 500128616073

Appendix A (continued)

15:10 Monday, August 26, 1991

Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.

ALL YEARS AVAILABLE



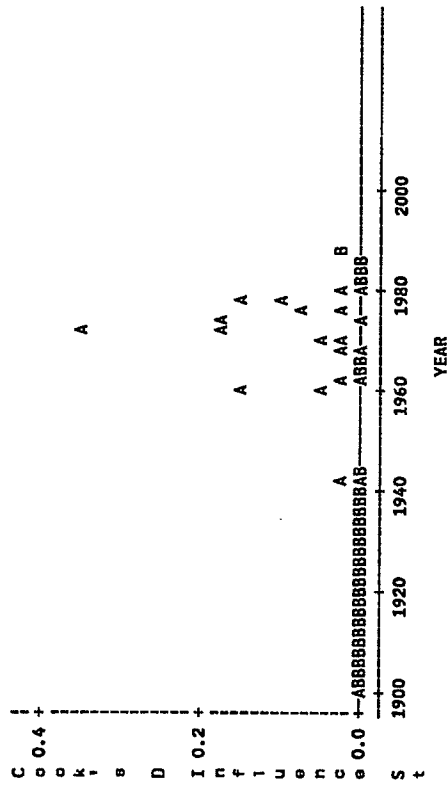


Appendix A (continued)

15:10 Monday, August 26, 1991

ALL YEARS AVAILABLE

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.



Appendix A (continued)

15:10 Monday, August 26, 1991

ALL YEARS AVAILABLE

OBS	YR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI	PRED	L95	U95	RESID	COOKD
1	1900	189000	275000			123000	66000	0.65079	0.34921	146525.39	-14326.83	307377.61	-23525.39	0.00139
2	1901	275000	240000			177000	98000	0.64364	0.35636	200160.11	39608.19	360712.02	-23160.11	0.00117
3	1902	240000	253000			171000	69000	0.71250	0.28750	178332.02	17662.59	339001.45	-7332.02	0.00012
4	1903	253000	315000			175000	78000	0.69170	0.30830	186439.60	25814.57	347064.63	-11439.60	0.00030
5	1904	315000	507000			207000	108000	0.64286	0.35714	225106.49	64680.95	385532.02	-18106.49	0.00067
6	1905	507000	487000			336000	171000	0.66272	0.33728	344849.11	184911.98	504786.24	-8849.11	0.00012
7	1906	487000	432000			316000	171000	0.64887	0.35113	323275.92	172397.07	492354.76	-16375.92	0.00041
8	1907	432000	416000			291000	141000	0.67361	0.32639	298074.65	137970.08	458179.21	-7074.65	0.00008
9	1908	416000	492000			286000	130000	0.68750	0.31250	288096.10	127951.93	448240.26	-2096.10	0.00001
10	1909	492000	387000			328000	164000	0.66667	0.33333	335494.22	175526.00	495462.43	-7494.22	0.00009
11	1910	387000	395000			251000	136000	0.64858	0.35142	270009.97	109790.56	430229.38	-19009.97	0.00065
12	1911	395000	426000			249000	146000	0.63038	0.36962	274999.25	114801.04	435197.45	-25999.25	0.00120
13	1912	426000	421000			258000	168000	0.60563	0.39437	294332.69	134213.44	454451.94	-36332.69	0.00224
14	1913	421000	421000			264000	157000	0.62708	0.37292	291214.39	131082.75	451346.03	-27214.39	0.00126
15	1914	421000	433000			263000	158000	0.62470	0.37530	291214.39	131082.75	451346.03	-28214.39	0.00136
16	1915	433000	437000			262000	171000	0.60508	0.39492	298698.31	138596.17	458800.44	-36698.31	0.00226
17	1916	437000	240000			267000	170000	0.61098	0.38902	301192.94	141100.48	461285.41	-34192.94	0.00195
18	1917	240000	118000			166000	74000	0.69167	0.30833	178332.02	17662.59	339001.45	-12332.02	0.00035
19	1918	118000	315000			91000	27000	0.77119	0.22881	102245.57	-58883.86	263374.99	-11245.57	0.00036
20	1919	315000	247000			239000	76000	0.75873	0.24127	225106.49	46680.95	385532.02	13893.51	0.00039
21	1920	247000	449000			202000	45000	0.81781	0.18219	182697.64	22052.23	343343.05	19302.36	0.00085
22	1921	449000	716000			316000	133000	0.70379	0.29621	308676.86	148612.88	468740.84	7323.14	0.00009
23	1922	716000	871000			437000	279000	0.61034	0.38966	475193.94	315564.60	634823.29	-38193.94	0.00170
24	1923	871000	893000			513000	358000	0.58998	0.41002	571861.17	412308.58	731413.75	-58861.17	0.00375
25	1924	893000	937000			534000	359000	0.59798	0.40202	585581.68	426029.51	745133.84	-51581.68	0.00288
26	1925	937000	849000			573000	364000	0.61153	0.38847	613022.69	453463.56	772581.83	-40022.69	0.00175
27	1926	849000	810000			491000	358000	0.57833	0.42167	558140.66	398585.05	717696.26	-67140.66	0.00490
28	1927	810000	753000			454000	356000	0.56049	0.43951	533817.94	374250.57	693385.31	-79817.94	0.00700
29	1928	753000	509000			436000	317000	0.57902	0.42098	498269.35	338670.07	657868.63	-62269.35	0.00439
30	1929	509000	350000			316000	193000	0.62083	0.37917	346096.43	186163.35	506029.51	-30096.43	0.00135
31	1930	350000	254000			227000	103000	0.68788	0.31212	234461.38	74081.05	394841.70	-7461.38	0.00011
32	1931	254000	134000			187000	67000	0.73622	0.26378	187063.26	26441.61	347684.91	-63.26	0.00000
33	1932	134000	93000			118000	16000	0.88060	0.11940	112224.12	-48840.54	273288.77	5775.88	0.00009
34	1933	93000	126000			76000	17000	0.81720	0.18280	86654.08	-74579.24	247887.39	-10654.08	0.00034
35	1934	126000	221000			109000	17000	0.86508	0.13492	107234.84	-59862.03	268331.72	1765.16	0.00001
36	1935	221000	319000	5000	0.02262	183000	38000	0.82805	0.17195	166482.49	5746.56	327218.42	16517.51	0.00065
37	1936	319000	336000	15000	0.04702	244000	75000	0.76489	0.23511	227601.12	67187.76	388014.49	16398.88	0.00054
38	1937	336000	406000	4000	0.01190	267000	69000	0.79464	0.20536	238203.34	77840.76	398565.91	28796.66	0.00163
39	1938	406000	515000	7000	0.01724	317000	89000	0.78079	0.21921	281859.50	121689.90	442029.10	35140.50	0.00216
40	1939	515000	603000	57000	0.11068	399000	116000	0.77476	0.22524	349838.39	189917.34	509759.43	49161.61	0.00357
41	1940	603000	706000	73000	0.12106	486000	117000	0.80597	0.19403	404720.42	244953.74	564487.10	81279.58	0.00866
42	1941	706000	356000	87000	0.12323	604000	102000	0.85552	0.14448	468957.35	309318.62	628596.08	135042.65	0.02143
43	1942	356000	191000	59000	0.15449	293000	63000	0.82303	0.17697	250676.53	90371.74	410981.31	42323.47	0.00340
44	1943	191000	142000	7000	0.03665	144000	47000	0.75393	0.24607	147772.71	-13072.09	308617.50	-3772.71	0.00004
45	1944	142000	326000	3000	0.02113	118000	24000	0.83099	0.16901	117213.39	-43819.38	278246.16	786.61	0.00000
46	1945	326000	1296000	34000	0.02188	1251000	303000	0.80502	0.19498	997820.60	837070.76	1158570.44	253179.40	0.15362
47	1960	1296000	1365000	42000	0.03281	1099000	287000	0.77855	0.22145	836916.45	676911.76	996921.15	172083.55	0.04645
48	1961	1365000	1492000	36000	0.02637	989000	376000	0.72454	0.27546	719779.59	1040118.32	109051.04	0.02079	
49	1962	1492000	1635000	39000	0.02614	996000	496000	0.66756	0.33244	959153.71	798615.12	1119692.31	36846.29	0.00293
50	1963	1635000	1561000	48000	0.02936	1013000	622000	0.61957	0.38043	1048937.02	887280.74	1209393.30	-35337.02	0.00343
51	1964	1561000	1510000	55000	0.03523	972000	589000	0.62268	0.37732	1002186.22	841411.26	1162961.18	-30186.22	0.00221

## Appendix A (continued)

52	1965	1510000	1196000	64000	0.04238	965000	545000	0.63907	0.36093	970379.59	809781.75	1130977.42	-5379.59	0.00006
53	1966	1196000	1322000	72000	0.06020	780000	416000	0.65217	0.34783	774550.50	614739.36	934361.65	5449.50	0.00004
54	1967	1322000	1545000	91000	0.06884	845000	477000	0.63918	0.36082	853131.60	693067.84	1013195.36	-8131.60	0.00011
55	1968	1545000	1500000	163000	0.10550	900000	645000	0.58252	0.41748	922207.67	831489.75	1152925.58	-92207.67	0.02007
56	1969	1500000	1469000	197000	0.13133	811000	689000	0.54067	0.45933	964142.99	803578.28	1124707.70	-153142.99	0.05130

Appendix A (continued)

15:10 Monday, August 26, 1991

ALL YEARS AVAILABLE

OBS	YR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI	PRED	L95	U95	RESID	COOKD
57	1970	1469000	2084500	431000	0.29340	813000	656000	0.55344	0.44656	944809.55	784344.16	1105274.93	-131809.55	0.03607
58	1971	2084500	2378500	441000	0.21156	1151000	933500	0.55217	0.44783	1328671.97	1165297.77	1492046.17	-177671.97	0.17735
59	1972	2378500	2057500	388000	0.16313	1309000	1069500	0.55035	0.44965	1512027.86	1346587.01	1677468.71	-203027.86	0.35188
60	1973	2057500	1352500	290000	0.14095	1132000	925500	0.55018	0.44982	1311833.16	1148627.27	1475039.09	-179833.16	0.17451
61	1974	1352500	1171400	142000	0.10499	888000	464500	0.55656	0.34344	872153.21	712015.56	1032290.87	15846.79	0.00443
62	1975	1171400	1547600	111000	0.09476	892000	279400	0.76148	0.23852	759208.48	599436.75	918980.21	132791.52	0.02322
63	1976	1547600	2001700	118000	0.07625	1162000	385600	0.75084	0.24916	993829.18	833102.09	1154556.28	168170.82	0.06705
64	1977	2001700	2036100	191000	0.09542	1451000	507000	0.72488	0.27512	1277032.96	1114163.27	1439902.65	173967.04	0.15009
65	1978	2036100	1760000	232000	0.11394	1433000	603100	0.70380	0.29620	1298486.85	1135411.75	1461561.95	134513.15	0.09454
66	1979	1760000	1312600	237000	0.13466	1194000	566000	0.67841	0.32159	1126294.46	964697.99	1287890.93	67705.54	0.01550
67	1980	1312600	1100300	208000	0.15846	852000	460600	0.64909	0.35091	847269.20	687227.21	1007311.19	4730.80	0.00004
68	1981	1100300	1072100	178000	0.16177	705000	393500	0.64073	0.35927	714866.29	555190.23	874542.35	-9866.29	0.00012
69	1982	1072100	1712500	178000	0.16603	663000	409100	0.61841	0.38159	697279.09	537633.46	856924.72	-34279.09	0.00139
70	1983	1712500	1755800	124000	0.07241	1068000	644500	0.62365	0.37635	1096670.63	935289.01	1258052.25	-28670.63	0.00257
71	1984	1755800	1745000	99000	0.05638	1084000	671800	0.61738	0.38262	1123675.09	962098.09	1285252.09	-39675.09	0.00529
72	1985	1745000	1807100	70000	0.04011	1072000	673000	0.61833	0.38567	1116939.57	956412.21	1278466.92	-44939.57	0.00666
73	1986	1807100	1622700	.	.	1179000	628100	0.65243	0.34757	1155668.82	993847.77	1317489.87	23331.18	0.00199
74	1987	1622700	1488100	.	.	1146000	476700	0.70423	0.29377	1040666.01	879658.48	1201673.54	105333.99	0.03986
75	1988	1488100	1374300	.	.	1081000	407100	0.72643	0.27357	956721.44	796195.46	1117247.43	124278.56	0.03312

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1900-1932

Model: MODEL1  
 Dependent Variable: SINGL SINGLE FAMILY HOME STARTS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	489310419331	489310419331	2116.318	0.0001
Error	31	7167459457.3	231208369.59		
C Total	32	4964778788			

Root MSE 15205.53746 R-square 0.9856  
 Dep Mean 288606.06061 Adj R-sq 0.9851  
 C.V. 5.26861

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	41816	5982.0759130	6.990	0.0001	Intercept
T	1	0.544718	0.01184080	46.003	0.0001	CURRENT YEAR HOUSING PRODUCTION

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1900-1932

Durbin-Watson D 0.863  
 (For Number of Obs.) 33  
 1st Order Autocorrelation 0.535

Obs	Dep Var SINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2-1-0 1 2	Cook's D
1	123000	144768	4096.644	-21767.6	14643.29	-1.487	**	0.086
2	177000	191613	3384.018	-14613.3	14824.20	-0.986	*	0.025
3	171000	172548	3656.620	-15648.2	14759.32	-0.105		0.000
4	175000	179630	3552.167	-4629.5	14784.81	-0.313		0.003
5	207000	213402	3111.063	-6402.0	14883.87	-0.430		0.004
6	336000	317988	2722.909	18012.2	14959.75	1.204	**	0.024
7	316000	307093	2677.277	8906.6	14967.98	0.595	*	0.006
8	291000	277134	2658.665	13866.0	14971.30	0.926	*	0.014
9	286000	268418	2683.074	17581.5	14966.95	1.175	**	0.022
10	328000	309817	2686.802	18183.0	14966.28	1.215	**	0.024
11	251000	252622	2760.103	-1621.7	14952.93	-0.108		0.000
12	249000	256979	2734.767	-7979.4	14957.59	-0.533	*	0.005
13	258000	273866	2666.268	-15865.7	14969.95	-1.060	**	0.018
14	264000	271142	2674.028	-7142.1	14968.57	-0.477	*	0.004
15	263000	271142	2674.028	-8142.1	14968.57	-0.544	*	0.005
16	262000	277679	2657.581	-15678.7	14971.49	-1.047	**	0.017
17	267000	279858	2653.767	-12857.6	14972.17	-0.859	*	0.012
18	166000	172548	3656.620	-6548.2	14759.32	-0.444		0.006
19	91000.0	106093	4769.324	-15092.7	14438.21	-1.045	**	0.060
20	239000	213402	3111.063	25598.0	14883.87	1.720	***	0.065
21	202000	176361	3599.935	25638.8	14773.25	1.735	***	0.089
22	316000	286394	2647.381	29605.8	14973.30	1.977	***	0.061
23	437000	431834	4086.520	5166.2	14646.12	0.353	***	0.005
24	513000	516265	5612.156	-3265.0	14131.95	-0.231		0.004
25	534000	528249	5843.152	5751.2	14038.02	0.410		0.015
26	573000	522216	6312.038	20783.6	13833.53	1.502	***	0.235
27	491000	504281	5383.854	-13281.2	14220.50	-0.934	*	0.063
28	454000	483037	4986.900	-29037.2	14364.51	-2.021	****	0.246
29	436000	451988	4429.404	-15988.3	14546.09	-1.099	**	0.056
30	316000	319077	2728.561	-3077.2	14958.72	-0.206		0.001
31	227000	221573	3021.516	5427.2	14902.31	0.364		0.003
32	187000	180174	3544.282	6825.7	14786.70	0.462		0.006
33	118000	114808	4612.926	3191.9	14488.94	0.220		0.002

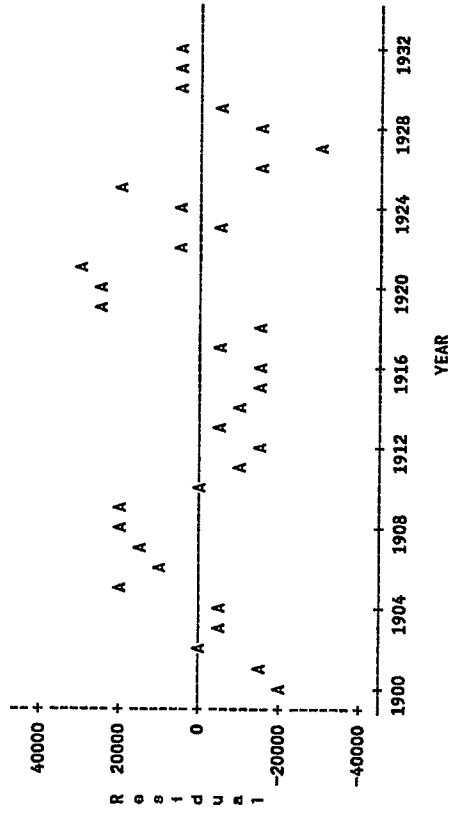
Sum of Residuals 0  
 Sum of Squared Residuals 7167459457.3  
 Predicted Resid SS (Press) 8211133527.0

Appendix A (continued)

YEARS 1900-1932

15:10 Monday, August 26, 1991

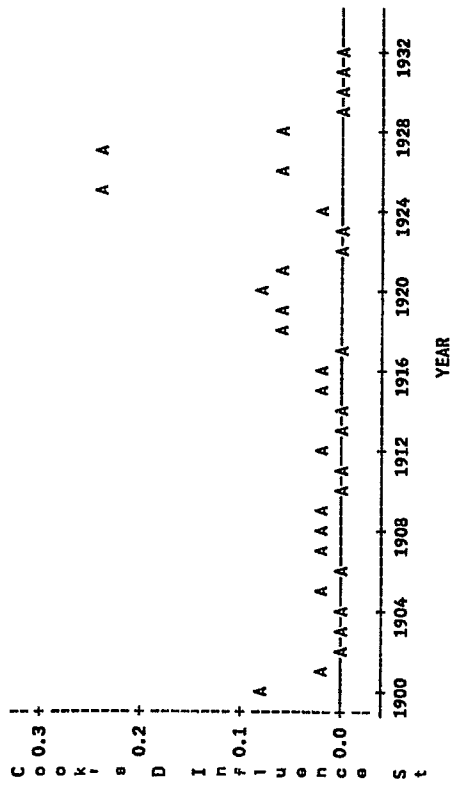
Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.



Appendix A (continued)

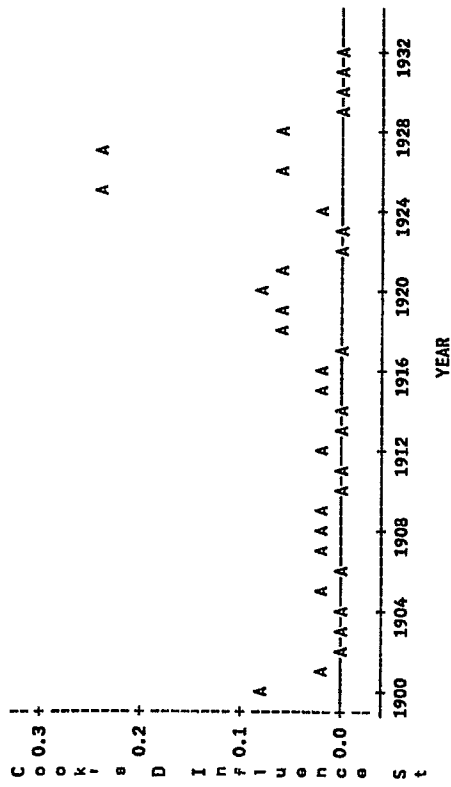
YEARS 1900-1932

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.



YEARS 1900-1932

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.





Appendix A (continued)

YEARS 1900-1932

15:10 Monday, August 26, 1991

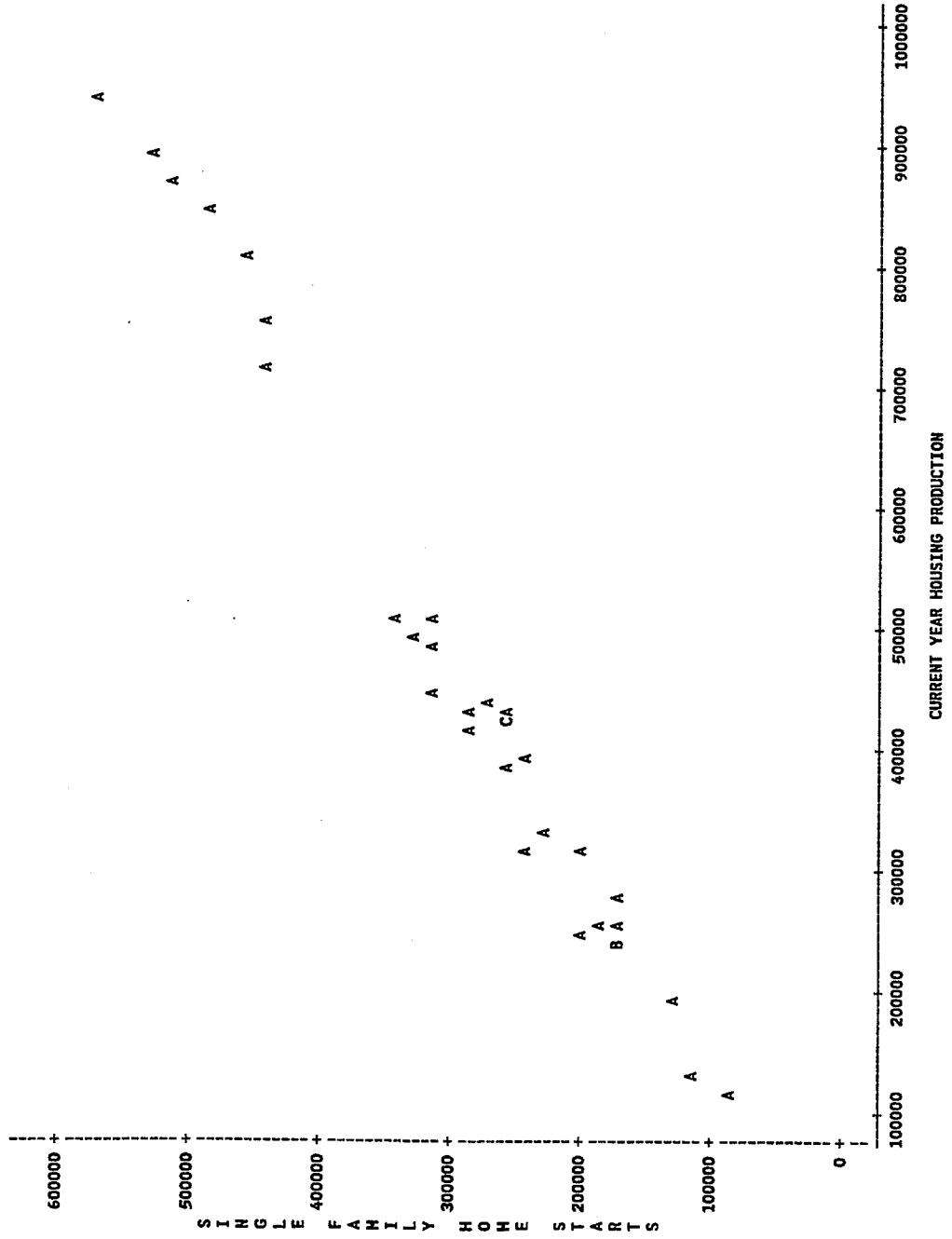
OBS	YR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI	PREL	L95	U95	RESID	COOKD
1	1900	189000	275000	.	.	123000	66000	0.65079	0.34921	144767.61	112650.13	176885.08	-21767.61	0.08648
2	1901	275000	240000	.	.	177000	98000	0.64364	0.35636	191613.32	159842.93	223383.71	-14613.32	0.02532
3	1902	240000	253000	.	.	171000	69000	0.71250	0.28750	140652.42	204443.99	1548.20	0.00034	0.00034
4	1903	253000	315000	.	.	175000	78000	0.69110	0.30830	179629.53	147782.88	211476.19	-4629.53	0.00283
5	1904	315000	507000	.	.	207000	108000	0.65714	0.34286	213402.02	181747.90	245056.15	-6402.02	0.00404
6	1905	507000	487000	.	.	336000	171000	0.66272	0.33728	317987.80	286482.81	349492.79	18012.20	0.02401
7	1906	487000	432000	.	.	316000	171000	0.64887	0.35113	307093.44	275604.73	338582.16	8906.56	0.00566
8	1907	432000	416000	.	.	291000	141000	0.67361	0.32639	277133.98	245651.82	308616.14	13866.02	0.01353
9	1908	416000	492000	.	.	286000	130000	0.68750	0.31250	268418.50	236927.73	299909.27	17581.50	0.02217
10	1909	492000	387000	.	.	328000	164000	0.66667	0.33333	309817.03	278324.94	341309.12	18182.97	0.02379
11	1910	387000	395000	.	.	251000	136000	0.64858	0.35142	252621.69	221103.24	284140.14	-1621.69	0.00020
12	1911	395000	426000	.	.	249000	146000	0.63038	0.36962	256979.43	225470.17	288488.69	-7979.43	0.00476
13	1912	426000	421000	.	.	258000	168000	0.60563	0.39437	273865.67	242380.84	305350.51	-15865.67	0.01782
14	1913	421000	421000	.	.	264000	157000	0.62708	0.37292	271142.09	239654.52	302629.65	-7142.09	0.00363
15	1914	421000	433000	.	.	263000	158000	0.62470	0.37530	271142.09	239654.52	302629.65	-7142.09	0.00363
16	1915	433000	437000	.	.	262000	171000	0.60508	0.39492	277678.70	246196.92	309160.47	-15678.70	0.01728
17	1916	437000	240000	.	.	267000	170000	0.61098	0.38902	279857.57	248377.13	311338.01	-12857.57	0.01158
18	1917	240000	118000	.	.	166000	74000	0.69167	0.30833	172548.20	140652.42	204443.99	-6548.20	0.00604
19	1918	118000	315000	.	.	91000	27000	0.77119	0.22881	106092.66	73591.28	138594.04	-15092.66	0.05962
20	1919	315000	247000	.	.	239000	76000	0.75873	0.24127	213402.02	181747.90	245056.15	25597.98	0.06462
21	1920	247000	449000	.	.	202000	45000	0.81781	0.18219	176361.23	144492.27	208230.18	25638.77	0.08942
22	1921	449000	716000	.	.	316000	133000	0.70379	0.29621	286394.18	254915.97	317872.38	29605.82	0.06111
23	1922	716000	871000	.	.	437000	279000	0.61034	0.38966	431833.77	399721.66	463945.88	5166.23	0.00484
24	1923	871000	893000	.	.	513000	358000	0.58898	0.41102	516264.99	483208.45	549321.54	-3264.99	0.00421
25	1924	893000	937000	.	.	534000	359000	0.59798	0.40202	528248.78	495026.17	561471.39	5751.22	0.01454
26	1925	937000	849000	.	.	573000	364000	0.61193	0.38847	552216.35	518638.85	585793.86	20783.65	0.02349
27	1926	849000	810000	.	.	491000	358000	0.57833	0.42167	504281.21	471382.99	537179.43	-13281.21	0.06251
28	1927	810000	753000	.	.	454000	356000	0.56049	0.43951	483037.22	450400.29	515674.15	-29037.22	0.24625
29	1928	753000	509000	.	.	436000	317000	0.57902	0.42098	451988.32	419687.65	484288.99	-15988.32	0.05601
30	1929	509000	330000	.	.	316000	193000	0.62083	0.37917	319077.23	287570.21	350584.25	-3077.23	0.00070
31	1930	330000	254000	.	.	227000	103000	0.68788	0.31212	221572.79	189954.76	253190.81	5427.21	0.00273
32	1931	254000	134000	.	.	187000	67000	0.73622	0.26378	180174.25	148331.25	212017.25	6825.75	0.00612
33	1932	134000	93000	.	.	118000	16000	0.88060	0.11940	114808.14	82400.80	147215.49	3191.86	0.00246

Appendix A (continued)

YEARS 1900-1932

15:10 Monday, August 26, 1991

Plot of SINGL\*Y. Legend: A = 1 obs, B = 2 obs, etc.



Appendix A (continued)

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1973 ON

Model: MODEL1  
 Dependent Variable: SINGL SINGLE FAMILY HOME STARTS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	592286651918	592286651918	58.957	0.0001
Error	14	140645098082	10046078434		
C Total	15	732931750000			

Root MSE 100230.12738 R-square 0.8081  
 Dep Mean 106225.00000 Adj R-sq 0.7944  
 C.V. 9.43231

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	78565	130586.99468	0.602	0.5570	Intercept
T	1	0.616410	0.08027898	7.678	0.0001	CURRENT YEAR HOUSING PRODUCTION

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1973 ON

Durbin-Watson D 0.530  
 (For Number of Obs.) 16  
 1st Order Autocorrelation 0.545

Obs	Dep Var SINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2-1-0 1 2	Cook's D
1	1132000	1346828	44697.75	-214828	89711.70	-2.395	****	0.712
2	888000	912260	31802.14	-24259.5	95051.05	-0.255		0.004
3	892000	800628	42333.93	91372.3	90851.07	1.006	**	0.110
4	1162000	1032521	25362.40	129479	96968.18	1.335	**	0.061
5	1451000	1312433	41065.13	138567	91431.58	1.516	***	0.232
6	1433000	1333637	43285.83	99362.7	90401.41	1.099	**	0.138
7	1194000	1163447	28289.46	30553.5	96155.01	0.318		0.004
8	852000	887665	33868.72	-35664.8	94334.45	-0.378		0.009
9	705000	756801	47055.95	-51801.0	88497.55	-0.585	*	0.048
10	663000	739418	48986.98	-76418.2	87483.43	-0.874	*	0.120
11	1068000	1134167	26733.75	-66167.1	96599.09	-0.685	*	0.018
12	1084000	1160858	28134.54	-76857.6	96200.45	-0.799	*	0.027
13	1072000	1154200	27751.04	-82200.4	96311.78	-0.853	*	0.030
14	1179000	1192479	30230.58	-13479.4	95562.50	-0.141		0.001
15	1146000	1078813	25146.07	67186.5	97024.50	0.692	*	0.016
16	1081000	995845	26523.98	85155.3	96656.90	0.881	*	0.029

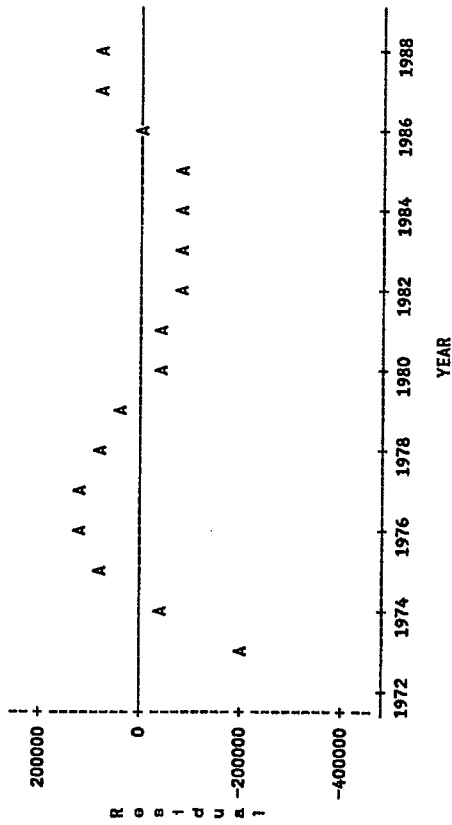
Sum of Residuals 0  
 Sum of Squared Residuals 14064509882  
 Predicted Resid SS (Press) 197713595229

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1973 ON

Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.

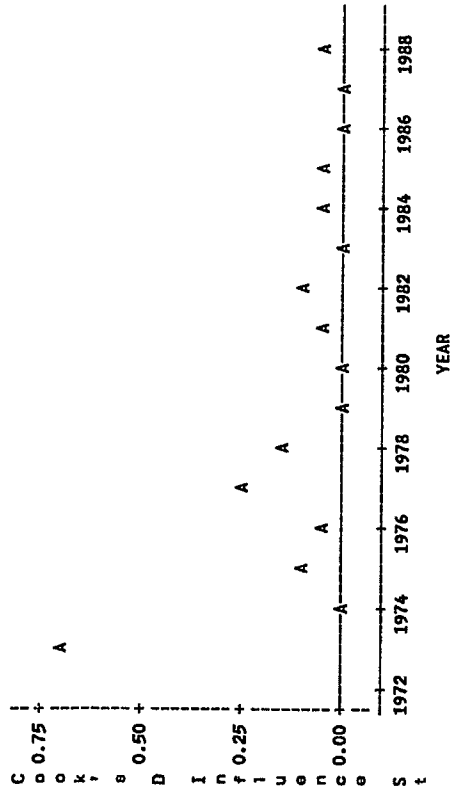


Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1973 ON

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.







Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1981 ON

Model: MODEL1

Dependent Variable: SINGL SINGLE FAMILY HOME STARTS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	245808865708	245808865708	46.722	0.0005
Error	6	31566634292	5261105715.3		
C Total	7	277375500000			

Root MSE 72533.47996 R-square 0.8862  
 Dep Mean 999750.00000 Adj R-sq 0.8672  
 C.V. 7.25516

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	24632	144944.91214	0.170	0.8706	Intercept
T	1	0.634038	0.09275873	6.835	0.0005	CURRENT YEAR HOUSING PRODUCTION

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1981 ON

Durbirn-Hatson D 0.405  
 (For Number of Obs.) 8  
 1st Order Autocorrelation 0.591

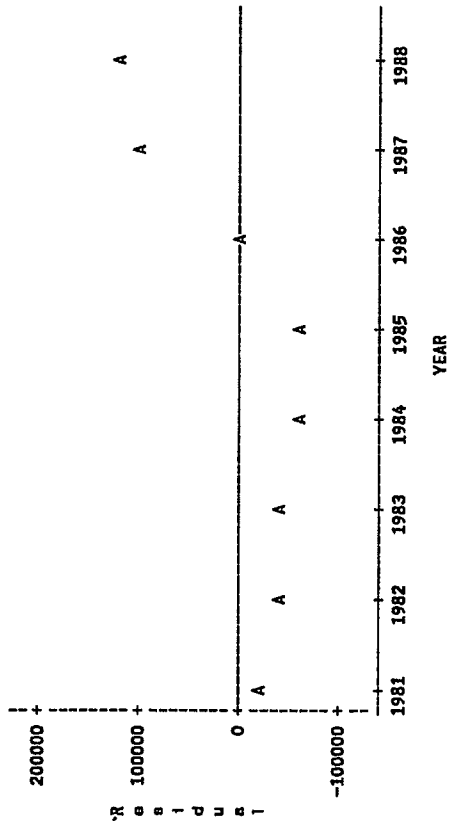
Obs	Dep Var SINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2-1-0 1 2	Cook's D
1	705000	722263	48017.31	-17263.4	58363.99	-0.318		0.039
2	663000	704384	50248.24	-41383.5	52308.89	-0.791	*	0.289
3	1068000	1110621	30328.01	-62421.3	65888.68	-0.644	*	0.044
4	1084000	1137875	32649.36	-53875.1	64769.78	-0.832	*	0.088
5	1072000	1131028	32038.99	-59027.5	65073.87	-0.907	*	0.100
6	1179000	1170401	35790.22	8598.8	63088.55	0.136		0.003
7	1146000	1053685	26822.35	92515.3	67391.89	1.373	**	0.149
8	1081000	968143	26058.01	112857	67691.11	1.667	***	0.206

Sum of Residuals 0  
 Sum of Squared Residuals 3156663622  
 Predicted Resid SS (Press) 48267949904

Appendix A (continued)

15:10 Monday, August 26, 1991

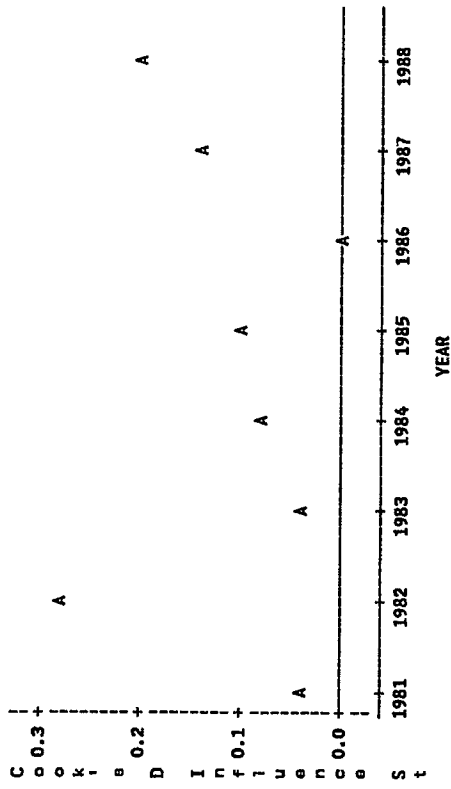
YEARS 1981 ON  
Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.



Appendix A (continued)

YEARS 1981 ON

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.



YEARS 1981 ON

Cook's Distance (COOKD\*YR) values for years 1981 through 1988. The y-axis is labeled 'Cook's Distance' and ranges from 0.0 to 0.3. The x-axis is labeled 'YEAR' and ranges from 1981 to 1988. Data points are marked with 'A' at various years: 1981 (approx 0.05), 1982 (approx 0.25), 1983 (approx 0.05), 1984 (approx 0.1), 1985 (approx 0.15), 1986 (approx 0.05), 1987 (approx 0.2), and 1988 (approx 0.25).

## Appendix A (continued)

YEARS 1981 ON

15:10 Monday, August 26, 1991

OBS	YR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI	PRED	L95	U95	RESID	COOKD
1	1981	1100300	1072100	178000	0.16177	705000	395300	0.64073	0.35927	722263.41	509613.32	935113.50	-17263.41	0.03933
2	1982	1072100	1712500	178000	0.16603	663000	409100	0.61841	0.38159	704383.54	488472.14	920294.95	-41383.54	0.28878
3	1983	1712500	1755800	124000	0.07241	1068000	644500	0.62365	0.37635	1110421.28	918048.21	1302794.35	-42421.28	0.04391
4	1984	1755800	1745000	99000	0.05638	1084000	671800	0.61738	0.38262	1137875.11	943240.29	1332509.93	-53875.11	0.08790
5	1985	1745000	1807100	70000	0.04011	1072000	673000	0.61433	0.38567	1131027.50	937000.94	1325054.06	-59027.50	0.09973
6	1986	1807100	1622700	.	.	1179000	628100	0.65243	0.34757	1170401.24	972487.74	1368314.75	8598.76	0.00299
7	1987	1622700	1488100	.	.	1146000	476700	0.70623	0.29377	1053484.69	864255.13	1242714.26	92515.31	0.14927
8	1988	1488100	1374300	.	.	1081000	407100	0.72643	0.27357	968143.22	779554.18	1156732.26	112856.78	0.20596

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1959 TO 1973

Model: MODEL1  
 Dependent Variable: SINGL SINGLE FAMILY HOME STARTS

Analyse of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	201332993116	201332993116	17.150	0.0012
Error	13	152611940218	1173980017		
C Total	14	353944933333			

Root MSE 108348.41954 R-square 0.5688  
 Dep Mean 995733.33333 Adj R-sq 0.5357  
 C.V. 10.88127

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	409021	144409.75320	2.832	0.0141	Intercept
T	1	0.367223	0.08867378	4.141	0.0012	CURRENT YEAR HOUSING PRODUCTION

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1959 TO 1973

Durbin-Watson D 0.372  
 (For Number of Obs.) 15  
 1st Order Autocorrelation 0.569

Obs	Dep Var SINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2-1-0 1 2	Cook's D
1	1251000	979686	28242.54	271314	104602.8	2.594	****	0.245
2	1009000	884942	38708.42	124058	101198.0	1.226	**	0.110
3	989000	910280	34762.10	78719.5	102620.5	0.767	*	0.034
4	996000	956918	29503.81	39082.2	104254.0	0.375		0.006
5	1013000	1009431	28170.29	3569.2	104622.2	0.034		0.000
6	972000	982256	28164.09	-10256.2	104623.9	-0.098		0.000
7	965000	963528	29036.22	1472.1	104385.2	0.014		0.000
8	780000	848220	45292.69	-68219.8	98427.39	-0.693	*	0.051
9	845000	894490	37152.37	-49489.9	101779.6	-0.486		0.016
10	900000	976381	28363.06	-76380.7	104570.2	-0.730	*	0.020
11	811000	959856	29286.18	-148856	104315.4	-1.427	**	0.080
12	813000	948472	30213.68	-135472	104050.5	-1.302	**	0.071
13	1151000	1174498	51438.93	-23497.6	95359.41	-0.246		0.009
14	1309000	1282461	74674.74	26538.8	78505.18	0.338		0.052
15	1132000	1164583	49446.92	-32582.6	96407.37	-0.338		0.015

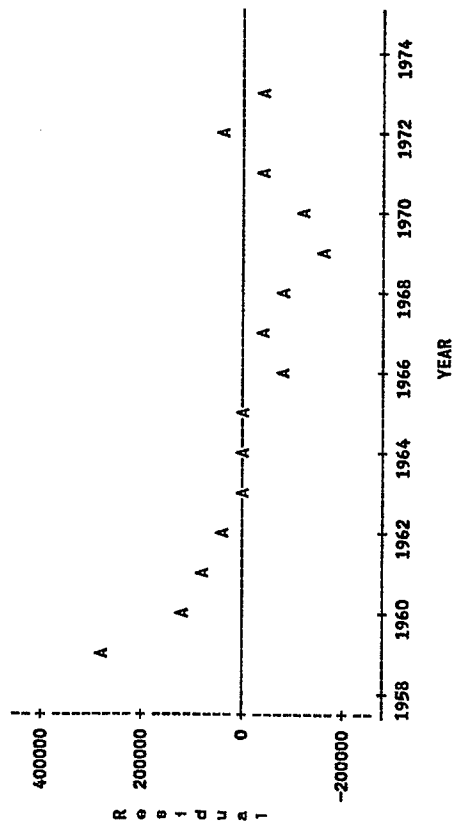
Sum of Residuals 0  
 Sum of Squared Residuals 152611940218  
 Predicted Resid SS (Press) 183817558344

Appendix A (continued)

15:10 Monday, August 26, 1991

YEARS 1959 TO 1973

Plot of RESID<sub>YR</sub>. Legend: A = 1 obs, B = 2 obs, etc.

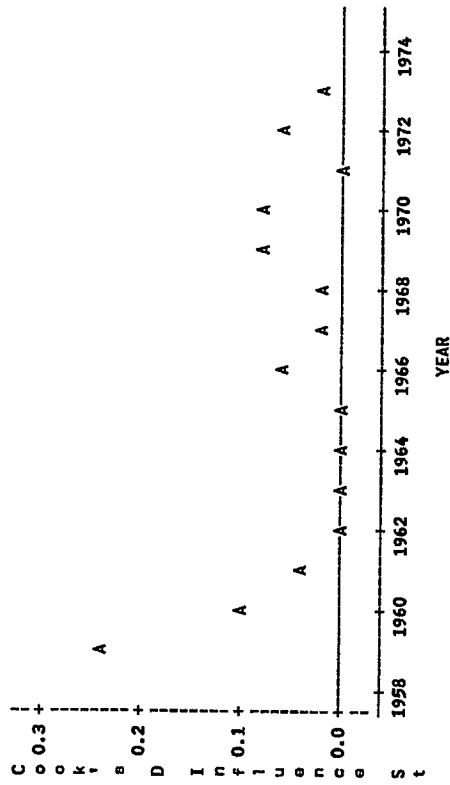




Appendix A (continued)

YEARS 1959 TO 1973

15:10 Monday, August 26, 1991  
 Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.



## Appendix A (continued)

15:10 Monday, August 26, 1991

OBS YR	T	TPLUS1	SUBS	PCTSUBS	SINGL	MULTI	PCTSINGL	PCTMULTI	PRED	L95	U95	RESID	COOKD	
1	1959	1554000	1296000	34000	0.02188	1251000	303000	0.80502	0.19498	979685.68	737791.85	1221579.51	271314.32	0.24522
2	1960	1296000	1365000	42000	0.03241	1009000	287000	0.77855	0.22145	884942.09	636380.37	1133503.80	124057.91	0.10994
3	1961	1365000	1492000	36000	0.02637	989000	376000	0.72454	0.27546	910280.49	664455.90	1156105.08	78719.51	0.03376
4	1962	1492000	1635000	39000	0.02614	996000	496000	0.66756	0.33244	956917.84	714322.39	1199513.29	39082.16	0.00563
5	1963	1635000	1561000	48000	0.02936	1013000	622000	0.61957	0.38043	1009430.76	767576.26	1251285.26	3569.24	0.00004
6	1964	1561000	1510000	55000	0.03523	972000	589000	0.62268	0.37732	982256.24	740405.11	1224107.38	-10256.24	0.00035
7	1965	1510000	1196000	64000	0.04238	965000	545000	0.63907	0.36093	963527.86	721195.85	1205859.86	1472.14	0.00001
8	1966	1196000	1322000	72000	0.06020	780000	416000	0.65217	0.34783	848219.77	594518.60	1101920.93	-68219.77	0.05086
9	1967	1322000	1545000	91000	0.06884	845000	477000	0.63918	0.36082	894489.89	647038.89	1141940.89	-49489.89	0.01575
10	1968	1545000	1500000	163000	0.10550	900000	645000	0.58252	0.41748	976380.67	734421.04	1218340.30	-76380.67	0.01963
11	1969	1500000	1469000	197000	0.13133	811000	689000	0.54067	0.45933	959855.63	717383.28	1202327.97	-148855.63	0.08025
12	1970	1469000	2084500	431000	0.29340	813000	656000	0.55344	0.44656	948471.71	705468.82	1191474.59	-135471.71	0.07147
13	1971	2084500	2378500	441000	0.21156	1151000	933500	0.55217	0.44783	1174497.60	915389.48	1433609.71	-234497.60	0.00883
14	1972	2378500	2057500	388000	0.16313	1309000	1069500	0.55035	0.44965	1282461.22	998180.38	1566742.06	26538.78	0.05170
15	1973	2057500	1352500	290000	0.14095	1132000	925500	0.55018	0.44982	1164582.57	907286.73	1421878.40	-32582.57	0.01502

Appendix A (continued)

The SAS System 15:36 Thursday, August 8, 1991

OBS	GDC	GDCSH	GDP	HNPI	HNPR	CONH	CONFR	COR77	FMSLSI	FYCPIM	HNMM	HS6FR	HS6P1	LEGHCC	PINDX
1	75.600	78.900	625.30	67.700	42.300	23014.67	29326.00	69494.00	778.67	.	3.60000	109.433	67.533	3.53667	26.3
2	75.700	79.200	634.00	68.500	42.800	21914.33	28180.67	66002.00	1024.67	.	3.73333	152.367	98.000	3.50667	26.6
3	76.000	79.400	642.80	69.400	43.300	21497.67	27703.33	63639.33	630.67	.	4.10000	132.900	87.233	3.55667	26.6
4	76.200	79.800	648.80	70.300	43.900	21139.00	27274.00	62748.33	1096.00	.	3.73333	114.933	70.700	3.61333	27.4
5	76.500	79.900	668.80	70.600	44.000	21876.67	28454.33	64379.00	636.00	.	3.86667	94.167	60.500	3.66000	27.3
6	77.000	80.200	681.70	70.200	44.800	21821.00	27888.00	62472.67	789.33	.	3.96667	151.233	98.900	3.65000	27.3
7	77.400	80.400	696.40	70.900	44.100	21729.33	27986.00	62472.67	399.67	.	3.60000	130.667	88.733	3.69667	27.2
8	77.800	80.600	717.20	72.300	45.100	21464.67	27614.67	61366.00	1012.67	.	3.63333	114.900	73.133	3.76667	28.2
9	78.500	81.000	738.50	71.900	44.700	22134.33	28679.33	64017.33	440.33	.	3.50000	91.233	60.067	3.80667	27.7
10	79.100	81.200	750.00	74.200	46.600	21295.00	26879.33	57453.33	258.67	.	3.80000	130.500	86.267	3.83333	29.0
11	79.800	81.700	760.60	73.700	45.900	19040.00	25823.67	55372.00	-242.00	.	3.80000	96.700	65.967	3.91333	28.6
12	80.300	82.200	774.90	74.000	45.700	16432.33	22976.00	49376.00	748.00	.	4.36667	69.867	47.233	3.98000	29.2
13	80.500	82.600	780.70	75.900	47.200	16107.67	22459.67	47684.33	844.67	.	3.50000	70.667	49.033	4.01667	29.1
14	80.900	82.900	788.60	75.500	47.100	17515.00	24618.33	52082.33	1181.33	.	3.33333	123.700	84.900	4.02667	29.2
15	81.600	83.400	805.70	75.800	49.600	19820.33	25598.67	53675.33	638.33	.	3.03333	124.867	81.400	4.14333	29.3
16	82.300	83.900	823.30	77.100	48.000	21653.00	28862.00	59547.33	886.67	.	3.00000	111.300	65.933	4.24333	29.9
17	83.400	84.400	841.20	79.200	49.300	22798.33	29122.67	59071.67	539.33	.	3.03333	97.233	59.967	4.31667	30.4
18	84.200	85.000	867.20	79.700	49.800	23735.67	30429.00	60577.67	705.67	.	2.80000	146.933	88.733	4.32000	30.7
19	85.000	85.600	884.90	79.800	49.600	24018.00	30605.00	60402.67	312.33	.	3.56667	136.867	83.000	4.42333	30.5
20	85.900	86.400	900.30	82.500	51.300	25422.33	31842.67	61511.33	935.33	.	3.86667	107.833	57.033	4.59667	32.4
21	86.800	87.100	921.20	84.800	52.800	26821.67	33843.33	63694.00	632.00	.	4.10000	153.933	86.333	4.70000	33.1
22	87.900	87.900	937.40	86.700	53.600	26708.67	34176.00	63840.67	499.00	.	4.03333	126.467	71.500	4.83000	33.3
23	88.900	88.800	955.30	87.100	54.200	25758.67	33542.67	61362.67	-75.67	.	4.13333	100.700	55.300	4.99667	33.6
24	90.000	89.800	962.00	88.300	54.800	24872.00	31399.33	56951.67	304.33	.	4.03333	85.133	45.567	5.08000	33.5
25	91.100	90.600	972.00	87.800	54.400	23531.00	31781.67	58676.00	131.67	.	3.83333	129.533	77.200	5.12333	35.0
26	92.000	91.500	986.30	90.900	56.400	22947.00	30345.67	53663.67	921.67	.	3.83333	129.533	77.200	5.12333	35.0

OBS	IPDHRS	IPDPCK	YR	QT	POTADJ	DATE	Q	QN	QRT	IG	LIG	LFMSLI	LLE6HCC	LCONH	LQRT	LQN
1	31.5	34.8	64	1	0.990	64Q1	0.75575	0.90517	0.76338	36.8058	.	778.67	3.53667	23014.67	.	.
2	31.5	34.9	64	2	0.990	64Q2	0.76504	0.90258	0.77277	34.5652	36.8058	1024.67	3.50667	21914.33	.	.
3	31.6	35.0	64	3	0.990	64Q3	0.76000	0.90286	0.76768	33.4438	34.5652	630.67	3.55667	21497.67	.	.
4	31.5	35.1	64	4	0.990	64Q4	0.78063	0.89744	0.78851	32.5817	33.4438	1096.00	3.61333	21139.00	0.76338	0.90517
5	31.9	35.4	65	1	0.989	65Q1	0.77119	0.90113	0.77976	32.7133	32.5817	636.00	3.66000	21878.67	0.77277	0.90258
6	31.9	35.6	65	2	0.989	65Q2	0.76685	0.89607	0.77538	32.0097	32.7133	789.33	3.65000	21821.00	0.76768	0.90286
7	32.2	35.7	65	3	0.989	65Q3	0.76190	0.90196	0.77038	31.2024	32.0097	399.67	3.69667	21729.33	0.78851	0.89744
8	32.4	35.9	65	4	0.989	65Q4	0.78552	0.90251	0.79425	29.9284	31.2024	1012.67	3.76667	21464.67	0.77976	0.90113
9	32.8	36.3	66	1	0.987	66Q1	0.76309	0.90358	0.77314	29.9720	29.9284	440.33	3.80667	22134.33	0.77538	0.89607
10	33.2	36.6	66	2	0.987	66Q2	0.79235	0.90710	0.80279	28.3933	29.9720	258.67	3.83333	21295.00	0.77038	0.90196
11	33.4	36.9	66	3	0.987	66Q3	0.77507	0.90515	0.78528	25.0329	28.3933	748.00	3.98000	16432.33	0.77314	0.90358
12	34.0	37.2	66	4	0.989	67Q1	0.78226	0.91667	0.79096	21.2057	25.0329	-242.00	3.91333	19040.00	0.79425	0.90251
13	34.1	37.2	67	1	0.989	67Q2	0.78075	0.91711	0.78943	20.6323	21.2057	844.67	4.02667	17515.00	0.78528	0.90515
14	34.3	37.4	67	2	0.989	67Q3	0.77513	0.91270	0.78375	24.6001	22.2102	638.33	4.14333	19820.33	0.79528	0.91398
15	34.5	37.8	67	3	0.989	67Q4	0.78478	0.91399	0.79531	26.3003	24.6001	886.67	4.24333	21653.00	0.79096	0.91667
16	34.8	38.1	67	4	0.988	68Q1	0.78756	0.91451	0.79173	27.1022	26.3003	539.33	4.31667	22798.33	0.78943	0.91711
17	35.3	39.1	68	1	0.988	68Q2	0.78517	0.91304	0.79470	27.3705	27.1022	705.67	4.32000	23735.67	0.78375	0.91270
18	35.7	39.5	68	2	0.988	68Q3	0.77215	0.91392	0.78193	27.1421	27.3705	312.33	4.42333	24018.00	0.79351	0.91339
19	36.1	39.9	68	3	0.988	68Q4	0.80201	0.91729	0.81175	28.2376	27.1421	935.33	4.54667	25622.33	0.79713	0.91451
20	36.6	40.3	69	1	0.983	69Q1	0.80397	0.92060	0.81787	29.1160	28.2376	632.00	4.59667	26821.67	0.79470	0.91304
21	37.1	40.3	69	2	0.983	69Q2	0.81127	0.92402	0.82530	28.4923	29.1160	.	.	.	.	.
22	37.7	40.8	69	2	0.983	69Q2	0.81127	0.92402	0.82530	28.4923	29.1160	.	.	.	.	.

## Appendix A (continued)

23	38.2	41.3	69	3	0.983	6903	0.80630	0.92494	0.82024	26.9640	28.4923	499.00	4.70000	26708.67	0.78153	0.91392
24	38.7	41.7	69	4	0.983	6904	0.80576	0.92806	0.81969	25.8545	26.9640	-75.67	4.83000	25758.67	0.81175	0.91729
25	39.3	42.2	70	1	0.982	7001	0.79384	0.93128	0.80839	24.2088	25.8545	304.33	4.99667	24872.00	0.81787	0.92060
26	39.9	42.7	70	2	0.982	7002	0.81967	0.93443	0.83470	23.2657	24.2088	131.67	5.08000	23531.00	0.82530	0.92402

Appendix A (continued)

The SAS System

15:36 Thursday, August 8, 1991

OBS	GDC	GDCSH	GNP	HNP1	HNPR	CONR	CONNR	COR77	FMSLSI	FYCP1M	HWHF	MS6FR	MS6P1	LE6HCC	PINDX
27	92.900	92.500	1003.60	89.500	54.900	24136.33	31093.00	56376.00	959.67	.	3.00000	133.467	76.267	5.3000	34.0
28	94.100	93.600	1009.00	89.000	55.300	26320.67	34484.33	62352.00	1659.67	.	2.73333	129.733	71.933	5.4367	34.3
29	95.000	94.800	1049.30	91.100	56.500	23690.80	37273.00	66032.33	3022.67	0.0000	2.83333	126.900	68.267	5.5167	35.1
30	96.100	96.000	1068.90	93.700	58.000	33783.67	41933.67	72331.00	2467.67	4.8967	2.43333	127.800	116.167	5.5833	35.9
31	97.000	97.000	1086.60	95.100	59.000	36913.00	45021.67	76261.00	1759.67	5.5900	2.90000	190.867	107.167	5.7333	36.8
32	97.700	97.900	1105.80	96.000	59.600	38702.00	47567.33	79452.00	2074.67	4.8233	2.96667	168.500	92.067	5.8733	37.5
33	98.800	98.700	1142.40	97.600	60.600	42731.33	51650.67	84939.00	3427.33	3.6633	2.83333	168.400	87.967	5.9367	37.9
34	99.500	99.500	1171.70	98.600	61.200	43684.67	53186.00	86575.67	2553.67	4.3233	2.96667	220.167	128.967	5.9633	38.3
35	100.400	100.400	1196.10	100.200	62.100	44755.00	54446.00	86695.00	2476.00	4.6667	3.20000	212.700	123.633	6.0667	38.8
36	101.300	101.400	1233.50	103.600	64.400	47979.67	57288.00	88084.67	2430.67	5.0600	3.36667	184.233	95.867	6.2733	40.3
37	102.800	102.800	1283.50	104.200	64.600	51617.67	62669.00	96316.67	2923.33	6.0867	3.86667	161.533	85.267	6.3267	41.0
38	104.800	104.000	1307.60	107.900	66.800	51358.33	60087.00	88593.33	1969.33	7.2867	4.56667	213.867	122.300	6.2900	41.4
39	106.600	105.400	1337.70	112.900	70.100	46981.33	60025.67	80131.33	1703.00	9.5300	5.30000	123.600	67.767	6.5933	43.1
40	108.800	106.700	1376.70	113.100	70.200	50677.33	60025.67	85558.33	150.00	9.8733	4.66667	182.733	102.000	6.4200	43.9
41	112.100	108.200	1387.70	115.600	71.800	43950.67	59505.00	73377.67	2728.00	8.8633	5.20000	166.233	59.267	6.5833	44.9
42	115.000	109.700	1423.80	118.300	73.400	42812.67	51614.67	69093.00	1008.00	10.7067	4.93333	152.033	99.267	6.6367	45.7
43	117.800	111.300	1451.60	121.000	75.200	40306.00	50360.67	65350.00	-67.00	11.7333	5.23333	112.000	81.300	6.9000	46.8
44	120.800	113.000	1473.80	123.800	77.000	35793.00	46400.00	58956.33	1687.00	9.4500	4.96667	75.633	56.133	7.1067	47.9
45	122.500	114.600	1479.80	128.200	80.000	32431.33	43251.33	53269.00	4326.67	6.6167	5.00000	63.667	47.433	7.1600	49.7
47	126.300	117.400	1578.50	131.500	82.000	34243.67	46912.67	56539.33	4295.67	5.6200	4.93333	108.100	86.967	7.2267	50.4
48	128.200	119.200	1621.80	134.500	84.000	38428.33	50830.00	60077.33	2927.33	6.3500	4.06667	116.167	89.333	7.3733	51.2
49	129.400	120.800	1672.00	137.200	85.400	42320.67	54294.67	65681.67	5426.00	4.8900	3.53333	93.600	73.000	7.4633	52.8
50	130.600	122.500	1698.60	140.900	88.000	45085.33	58764.67	66783.67	3605.33	5.1900	3.63333	146.433	113.200	7.5733	54.6
51	132.400	124.300	1729.00	143.800	90.800	47851.00	57611.33	64008.67	3736.00	5.1600	3.76667	144.767	111.200	7.7900	56.0
52	134.400	126.100	1772.50	147.200	92.100	52599.00	69235.33	74888.33	4094.33	4.7267	3.56667	127.633	90.033	7.9467	56.4

OBS	IPBNS	IPDPCX	YR	QT	POTADJ	DATE	Q	QN	QRT	IG	LIG	LFMSLSI	LLE6HCC	LCONH	LQRT	LQN
27	40.0	43.1	70	3	0.982	70Q3	0.78886	0.92807	0.80332	24.0498	23.2657	921.67	5.1233	22947.00	0.82024	0.92494
28	40.2	43.6	70	4	0.982	70Q4	0.78670	0.92202	0.80112	26.0859	24.0498	959.67	5.3000	24136.33	0.81969	0.92806
29	41.3	44.2	71	1	0.989	71Q1	0.79412	0.93439	0.80295	26.2951	26.0859	1659.67	5.4367	26320.67	0.80839	0.93128
30	42.2	44.7	71	2	0.989	71Q2	0.79407	0.93407	0.81206	31.6060	28.2951	3022.67	5.5167	29690.00	0.83470	0.93443
31	42.8	45.2	71	3	0.989	71Q3	0.81416	0.94690	0.82321	33.9711	31.6060	2467.67	5.5833	33783.67	0.80332	0.92807
32	43.4	45.7	71	4	0.989	71Q4	0.82057	0.94967	0.82970	34.9991	33.9711	1759.67	5.7333	36913.00	0.80112	0.92202
33	43.9	46.1	72	1	0.990	72Q1	0.82213	0.95228	0.83043	37.4049	34.9991	2074.67	5.8733	38702.00	0.80295	0.93439
34	44.3	46.5	72	2	0.990	72Q2	0.82366	0.95269	0.83198	37.2832	37.4049	3427.33	5.9367	42731.33	0.81206	0.94407
35	44.6	46.9	72	3	0.990	72Q3	0.82729	0.95096	0.83565	37.4174	37.2832	2553.67	5.9633	43684.67	0.83231	0.94690
36	44.7	47.3	72	4	0.990	72Q4	0.85201	0.94503	0.86061	38.8972	37.4174	2476.00	6.0667	44755.00	0.82970	0.94967
37	45.1	48.1	73	1	0.980	73Q1	0.85239	0.93763	0.86979	40.2163	38.8972	2430.67	6.2733	47979.67	0.83043	0.95228
38	45.8	49.1	73	2	0.980	73Q2	0.84318	0.93279	0.86038	39.2768	40.2163	2923.33	6.3267	51617.67	0.83198	0.95269
39	46.3	49.9	73	3	0.980	73Q3	0.86373	0.92786	0.88135	37.8839	39.2768	1569.33	6.2900	51358.33	0.83565	0.95096
40	46.8	51.1	73	4	0.980	73Q4	0.85910	0.91585	0.87663	34.1261	37.8839	190.00	6.4200	50677.33	0.86061	0.94503
41	47.6	52.8	74	1	0.970	74Q1	0.85038	0.90152	0.87668	31.6716	34.1261	1703.00	6.5933	46981.33	0.86979	0.93763
42	49.0	54.1	74	2	0.970	74Q2	0.84473	0.90573	0.87086	30.0693	31.6716	2728.00	6.5833	43950.67	0.86038	0.93279
43	51.7	55.5	74	3	0.970	74Q3	0.84324	0.93153	0.86932	27.7666	30.0693	1008.00	6.6367	42812.67	0.88135	0.92786
44	54.0	56.6	74	4	0.970	74Q4	0.84629	0.95406	0.87246	24.2862	27.7666	-67.00	6.9000	40306.00	0.87663	0.91585
45	56.2	57.7	75	1	0.973	75Q1	0.86135	0.97400	0.88525	21.9160	24.2862	1687.00	7.1067	35793.00	0.87668	0.90152
46	57.6	58.4	75	2	0.973	75Q2	0.86301	0.98630	0.88696	20.8657	21.9160	4326.67	7.1600	32431.33	0.87086	0.90573
47	58.5	59.7	75	3	0.973	75Q3	0.85762	0.97990	0.88142	21.6938	20.8657	4295.67	7.2267	31647.00	0.86932	0.93153
48	59.4	60.8	75	4	0.973	75Q4	0.86184	0.97697	0.88576	23.6949	21.6938	2719.00	7.3733	34243.67	0.87246	0.95406

Appendix A (continued)

49	60-3	61.4	76	1	0.985	7601	0.85993	0.98208	0.87303	25.2576	23.6949	2927.33	7.4567	38428.33	0.88525	0.97400
50	61.5	62.1	76	2	0.985	7602	0.87923	0.99034	0.89262	26.5426	25.2576	5426.00	7.4633	42230.67	0.88696	0.98630
51	62.4	63.0	76	3	0.985	7603	0.88889	0.99048	0.90243	27.6755	26.5426	3605.33	7.5733	45085.33	0.88142	0.97990
52	63.5	63.9	76	4	0.985	7604	0.88263	0.99374	0.89607	29.6750	27.6755	3736.00	7.7900	47851.00	0.88576	0.97697

Appendix A (continued)

The SAS System

15:36 Thursday, August 8, 1991

OBS	GDC	GDCSH	GNP	HNPI	HNPR	CORH	CONNFR	COR77	FHDSLI	FYCPH	HNMH	HS6FR	HS6PI	LE6HCC	PINDX
53	136.500	128.400	1834.80	152.600	95.500	57584.67	72056.00	75616.33	5390.67	4.6100	3.50000	122.467	89.567	7.9733	58.3
54	138.300	130.500	1895.10	158.300	99.100	65261.33	80576.00	81954.33	4042.00	5.0067	3.70000	193.700	146.700	7.9767	60.4
55	140.300	132.500	1954.40	160.800	100.800	67294.33	83211.67	82939.67	4322.33	5.6357	3.70000	187.167	136.767	8.1400	61.3
56	142.200	134.900	1988.90	170.000	106.600	70531.33	85205.00	80388.00	3250.33	6.4233	3.66667	159.033	110.600	8.2800	66.5
57	144.400	137.200	2031.70	171.700	108.100	69867.00	84667.00	78418.33	4185.33	6.5067	4.03333	120.667	85.833	8.3600	65.0
58	147.700	139.800	2139.50	178.700	112.400	76606.00	94592.33	84103.67	3211.67	7.0033	3.66667	208.167	149.700	8.4967	68.4
59	150.500	142.300	2202.50	186.500	117.300	75888.67	96084.67	82084.33	3941.33	7.8833	3.93333	187.867	134.633	8.7567	71.2
60	153.900	145.300	2281.60	192.900	121.000	77597.67	96061.00	79587.67	3616.33	9.6000	4.33333	156.733	107.633	8.9133	73.1
61	157.000	147.600	2335.50	198.000	124.700	76701.33	96582.67	77569.33	5290.67	9.8133	4.63333	108.533	75.533	9.0033	75.7
62	160.500	150.200	2377.90	206.600	130.800	78842.33	98564.67	76824.67	2569.67	9.7833	4.93333	180.633	128.967	9.1100	79.7
63	164.200	153.800	2454.80	212.900	134.100	81238.33	101542.33	76795.67	2676.67	10.6133	4.66667	166.067	114.300	9.3733	81.2
64	168.100	158.100	2502.90	216.200	137.100	77196.00	99029.67	73363.00	2564.33	13.2500	4.76667	126.433	79.233	9.5233	82.8
65	172.700	161.100	2572.90	220.500	139.400	71193.00	95910.00	69364.33	2808.33	14.4133	5.00000	79.367	50.300	9.5767	85.1
66	176.900	164.300	2578.80	228.500	144.600	57189.67	80193.67	56238.00	2925.33	11.4200	6.40000	101.433	67.767	9.7600	87.5
67	181.100	168.200	2639.10	234.600	147.600	58279.33	81984.00	56713.67	3547.00	9.6100	5.76667	129.433	90.867	10.0600	89.4
68	185.300	172.400	2736.00	234.300	148.100	67757.33	93031.67	63308.67	4750.67	15.5900	4.50000	120.500	75.100	10.3000	90.7
69	189.200	176.600	2875.80	242.600	153.700	71587.00	96302.33	63839.33	2860.67	15.8967	4.33333	88.067	55.500	10.4633	94.0
70	192.700	180.600	2918.00	248.700	157.300	68620.00	91613.67	60069.00	-296.33	16.6800	5.16667	112.900	76.633	10.5733	96.2
71	196.400	185.200	3009.30	250.400	158.400	60466.67	84427.33	53726.33	-949.33	17.0767	5.36667	90.100	61.600	10.9500	97.8
72	199.800	190.400	3027.90	256.500	161.100	52615.67	77016.67	43127.67	3164.67	13.1033	5.83333	70.300	41.367	11.2300	99.5
73	202.500	193.900	3026.00	.	162.900	49771.00	70420.00	43810.00	3495.00	13.8367	4.90000	58.900	37.867	11.4933	99.3
74	204.500	196.900	3061.20	.	163.800	49128.00	73741.67	46311.33	858.00	14.0433	4.10000	91.333	59.400	11.4533	100.9

OBS	IPDNR	IPDCX	YR	QT	POTADJ	DATE	Q	QN	QRT	IG	LIG	LCONH	LQRT	LQN		
53	64.2	65.0	77	1	0.987	7701	0.89692	0.98769	0.90874	31.3847	29.6750	4094.33	7.9467	52599.00	0.87303	0.98208
54	65.4	66.3	77	2	0.987	7702	0.91101	0.98643	0.92201	34.4369	31.3847	5390.67	7.9733	57584.67	0.89262	0.99034
55	66.5	67.3	77	3	0.987	7703	0.91085	0.98811	0.92284	34.4322	34.4369	4042.00	7.9767	6261.33	0.90243	0.99048
56	68.1	68.3	77	4	0.987	7704	0.94436	0.99707	0.95680	35.4625	34.4322	4322.33	8.1400	67294.33	0.89607	0.99374
57	69.2	69.3	78	1	0.982	7801	0.93795	0.99856	0.95514	34.3884	35.4625	3250.33	8.2800	70531.33	0.90874	0.98769
58	70.8	70.9	78	2	0.982	7802	0.96474	0.99859	0.98242	35.8056	34.3884	4185.33	8.3600	69867.00	0.92301	0.98643
59	72.2	72.3	78	3	0.982	7803	0.98479	0.99862	1.00284	35.2275	35.8056	3211.67	8.4967	76606.00	0.92284	0.98811
60	73.7	73.7	79	1	0.970	7901	1.00665	1.00133	1.03778	32.8415	34.0102	3616.33	8.9133	77597.67	0.95514	0.99856
61	75.3	75.2	79	2	0.970	7902	1.03372	0.99870	1.06569	33.1563	32.8415	5290.67	9.0033	76701.33	0.98242	0.99859
62	77.0	79.2	79	3	0.970	7903	1.02525	0.99369	1.05996	33.0937	33.1563	2569.67	9.1100	78842.33	1.00284	0.99862
63	80.0	81.1	79	4	0.970	7904	1.02096	0.98644	1.05254	30.8426	33.0937	2676.67	9.3733	81238.33	1.01004	1.00000
64	80.0	83.5	80	1	0.956	8001	1.01916	0.98443	1.06407	27.6703	30.8426	2564.33	9.5233	77196.00	1.03778	1.00133
66	84.2	85.5	80	2	0.956	8002	0.67251	0.98480	0.70347	22.1769	27.6703	2808.33	9.5767	71193.00	1.06569	0.99870
67	86.3	87.6	80	3	0.956	8003	1.02055	0.98516	1.06752	22.0830	22.1769	2925.33	9.7600	57189.67	1.05696	0.99369
68	87.9	89.8	80	4	0.956	8004	1.01002	0.97884	1.05651	24.7651	22.0830	3547.00	10.0600	58279.33	1.05254	0.98644
69	90.2	92.1	81	1	0.955	8101	1.02063	0.97937	1.06872	24.8929	24.7651	4750.67	10.3000	67757.33	1.06607	0.98443
70	92.2	93.8	81	2	0.955	8102	1.02559	0.98294	1.07391	23.5161	24.8929	2860.67	10.4633	71587.00	0.70347	0.98480
71	94.4	95.5	81	3	0.955	8103	1.02408	0.98848	1.07234	23.5161	23.5161	-296.33	10.5733	68620.00	1.06752	0.98516
72	96.8	97.0	81	4	0.955	8104	1.02577	0.99794	1.07411	17.3770	20.0933	-949.33	10.9500	60466.67	1.05651	0.97884
73	98.7	98.3	82	1	0.963	8201	1.01017	1.00407	1.04899	16.4478	17.3770	3164.67	11.2300	52615.67	1.06872	0.97937
74	99.9	99.2	82	2	0.963	8202	1.01714	1.00706	1.05622	16.0486	16.4478	3495.00	11.4933	49771.00	1.07391	0.98294

## Appendix A (continued)

15:36 Thursday, August 8, 1991

The SAS System

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
GDC	IMPLICIT PR DEFLATOR: PERSONAL CONSUMPTI	74	117.8918919	38.3360864	75.6000061	204.5000000
GDCSH	IMPLICIT PRICE DEFL. PCE: HOUSING	74	114.3013506	33.4933672	78.8999939	196.8999939
GNP	GROSS NATIONAL PRODUCT, TOTAL	74	1491.73	734.6956396	625.3000488	3061.20
HNP1	NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1	72	126.2583334	56.2763171	67.6999969	256.5000000
HNP1R	NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1	74	81.3013526	37.8938876	42.3000031	163.8000031
CONH	CONSTRUCT.PUT IN PLACE: NEW HOUSING UNIT	74	42090.50	19702.16	16107.67	81238.33
CONHR	CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL	74	54084.92	25161.01	22459.67	101542.33
COR77	CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL	74	66678.00	11850.92	43810.00	96316.67
FNDSLI	NET INFLOW OF SAVINGS: ALL OPER.SAVINGS	74	2031.33	1571.99	-949.3333333	5426.00
FYCP1M	INTEREST RATE: COMMERCIAL PAPER, 1-MONTH	46	8.4482609	4.0093956	0	17.0766662
HNMH	NEW 1-FAMILY HOUSES, MEDIUM NUMBER OF MO	74	4.0072072	0.8249214	2.4333334	6.3999999
HS6FR	HOUSING STARTS: TOTAL NEW PRIV HOUSING U	74	130.3369374	38.9921029	58.8999990	220.1666718
HS6P1	HOUSING STARTS: NEW PRIV 1 UNIT STRUCTUR	74	83.5207206	25.5312772	37.8666687	149.6999969
LE6HCC	AVG HR EARNINGS OF CONSTR MKRS: CONSTRUC	74	6.5970270	2.3258225	3.5066665	11.4833332
P1NDX	CENSUS BUREAU CONSTANT QUALITY HS. INDX.	74	49.6297297	22.5002267	26.3000000	100.9000000
IPDMRS	NON-RES. STRUCTURES DEFLATOR	74	53.6108108	20.3403746	31.5000000	99.9000000
IPDPCK	CONSUMPTION DEFLATOR	74	55.8310811	19.2438635	34.8000000	99.9000000
YR	YEAR	74	72.7567568	5.3808662	64.0000000	82.0000000
QT	QUARTER	74	2.4729730	1.1253368	1.0000000	4.0000000
POTADJ	POTERBA'S ADJUSTMNT FCTR, (1984, 740)	74	0.9798108	0.0110809	0.9550000	0.9900000
DATE	DATE	74	4793.53	1963.74	1461.00	8126.00
Q	HS PRC INDX / PERS CONSUMPT DEFLATOR	74	0.8613216	0.0921370	0.6725146	1.0337224
QN	PRC OF ALT OUTPUTS / CONSUMPT DEFLATOR	74	0.9494142	0.0366854	0.8960674	1.0070565
QRT	PRICE ADJUSTED BY POTERBA FACTOR	74	0.8798955	0.1019376	0.7034672	1.0741081
IG	CONST PUT IN PLACE/GNP	74	28.9477217	5.7936688	16.0486086	40.2163355
LIG	LAG(IG)	73	29.1244219	5.6294060	16.4477859	40.2163355
LFMDSLI	LAG(FMDSLI)	73	2047.40	1576.74	-949.3333333	5426.00
LLEGHCC	LAG(LE6HCC)	73	6.5305023	2.2699213	3.5066665	11.4933332
LCONH	LAG(CONH)	73	41994.09	19820.93	16107.67	81238.33
LQRT	LAG(QRT)	70	0.8694373	0.0945220	0.7034672	1.0739124
LQN	LAG(QN)	70	0.9465586	0.0356073	0.8960674	1.0013298



Appendix A (continued)

The SAS System

CONTENTS PROCEDURE

Data Set Name: WORK.TEMP  
 Member Type: DATA  
 Engine: V606  
 Created: 15:36 Thursday, August 8, 1991  
 Last Modified: 15:36 Thursday, August 8, 1991  
 Data Set Type:  
 Label:

Observations: 74  
 Variables: 31  
 Indexes: 0  
 Observation Length: 248  
 Deleted Observations: 0  
 Compressed: YES  
 Reuse Space: YES

Engine/Host Dependent Information

Data Set Page Size: 3072  
 Number of Data Set Pages: 7  
 User-id : U31077  
 File : TEMP WORK

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Pos	Format	Label
6	CONH	Num	8	40		CONSTRUCT.PUT IN PLACE: NEW HOUSING UNIT
7	CONHFR	Num	8	48		CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL
8	COR77	Num	8	56		CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL
21	DATE	Num	8	160	YYQ4.	
9	FHDSLI	Num	8	64		NET INFLOW OF SAVINGS: ALL OPER.-SAVINGS
10	FYCP1H	Num	8	72		INTEREST RATE: COMMERCIAL PAPER, 1-MONTH
1	GDC	Num	8	0		IMPLICIT PR DEF. PCE: HOUSING
2	GDCSH	Num	8	8		IMPLICIT PRICE DEF. PCE: HOUSING
3	GHP	Num	8	16		GROSS NATIONAL PRODUCT, TOTAL
11	HNMH	Num	8	80		NEW 1-FAMILY HOUSES, MEDIUM NUMBER OF HO
4	HNP1	Num	8	24		NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1
5	HNPR	Num	8	32		NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1
12	HS6FR	Num	8	88		HOUSING STARTS: TOTAL NEW PRIV HOUSING U
13	HS6P1	Num	8	96		HOUSING STARTS: NEW PRIV 1 UNIT STRUCTUR
25	IG	Num	8	192		CONST PUT IN PLACE/GNP
16	IPDNRS	Num	8	120		NON-RES. STRUCTURES DEFLATOR
17	IPDPCX	Num	8	128		CONSUMPTION DEFLATOR
29	LCONH	Num	8	224		LAG(CONH)
14	LE6HCC	Num	8	104		AVG HR EARNINGS OF CONSTR MKRS: CONSTRUC
27	LFHDSLI	Num	8	208		LAG(FHDSLI)
26	LIG	Num	8	200		LAG(IG)
28	LLE6HCC	Num	8	216		LAG(LE6HCC)
31	LQN	Num	8	240		LAG4(QN)
30	LQRT	Num	8	232		LAG4(QRT)
15	P1NDX	Num	8	112		CENSUS BUREAU CONSTANT QUALITY HS. INDX.
20	POTADJ	Num	8	152		POTERBA'S ADJUSTMNT FCTR, (1984, 740)
22	Q	Num	8	168		HS PRC INDX / PERS CONSUMPT DEFLATOR
23	QN	Num	8	176		PRC OF ALT OUTPUTS / CONSUMPT DEFLATOR
24	QRT	Num	8	184		PRICE ADJUSTED BY POTERBA FACTOR
19	QT	Num	8	144		QUARTER
18	YR	Num	8	136		YEAR

Appendix A (continued)

15:36 Thursday, August 8, 1991

The SAS System

Model: MODEL1

Dependent Variables: CONH

CONSTRUCT.PUT IN PLACE: NEW HOUSING UNIT

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	2	23186893246	11593446623	226.948	0.0001
Error	67	3422637199.9	51084137.311		
C Total	69	26609530446			

Root MSE 7147.31679 R-square 0.8714  
 Dep Mean 43244.72857 Adj R-sq 0.8675  
 C.V. 16.52760

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-451797	27552.381833	-16.398	0.0001	Intercept
LQRT	1	-7353.333499	14324.618552	-0.513	0.6094	LAG4(QRT)
LQN	1	529746	38025.709136	13.931	0.0001	LAG4(QN)

Appendix A (continued)

The SAS System

Autoreg Procedure

Dependent Variable = LCONH LAG(CONH)

Ordinary Least Squares Estimates

SSE	3.4374E9	DFE	64
MSE	53709719	Root MSE	7328.691
SBC	1463.807	AIC	1450.316
Reg Req	0.8729	Total Req	0.8729
Durbin-Watson	0.5188		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	37250.5076	59240	0.629	0.5317
CONRHAT	1	0.7885807947	0.110022	7.167	0.0001
QRT	1	43620.3851	19508	2.236	0.0288
QH	1	-79986.4077	67657	-1.182	0.2415
LLEGHCC	1	1325.5754	1275	1.040	0.3023
FMSLI	1	0.0833351043	0.834339	0.100	0.9208

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
0	49106028	1.000000																						
1	34440200	0.701344																						

Preliminary MSE = 24951614

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.70134363	0.08980730	-7.809428

Yule-Walker Estimates

SSE	1.0742E9	DFE	63
MSE	17051443	Root MSE	4129.339
SBC	1387.315	AIC	1371.575
Reg Req	0.6606	Total Req	0.9603

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	10940.8373	57893	0.189	0.8507
CONRHAT	1	0.5610654215	0.119541	4.693	0.0001
QRT	1	-3575.6819	9119	-0.392	0.6963

## Appendix A (continued)

QN	1	-12144.4252	66873	-0.182	0.8565
LLE6HCC	1	3341.4372	1387	2.408	0.0190
FMSLI	1	-0.230038818	0.46279	-0.497	0.6209



Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

OBS	GDC	GDCSH	GHP	HNP1	HNPR	CONH	CONNFR	COR77	FHDSLI	FYCP1M	HNMH	HS6FR	HS6P1	LE6HCC	P1NDX	
1	75.600	78.900	625.30	67.700	42.300	23014.67	29326.00	69494.00	778.67	.	3.60000	109.433	67.533	3.53667	26.3	
2	75.700	79.200	634.00	68.500	42.800	21914.33	28180.67	66002.00	1024.67	.	3.73333	152.367	98.000	3.50667	26.7	
3	76.000	79.400	642.80	69.400	43.300	21497.67	27703.33	63639.33	630.67	.	4.10000	132.900	87.233	3.55667	26.6	
4	76.200	79.800	648.80	70.300	43.900	21139.00	27274.00	62748.33	1096.00	.	3.73333	114.933	70.700	3.61333	27.4	
5	76.500	79.900	668.80	70.600	44.000	21878.67	28454.33	64379.00	636.00	.	3.86667	94.167	60.500	3.66000	27.3	
6	77.000	80.200	681.70	70.200	43.800	21821.00	27838.67	63270.33	789.33	.	3.96667	151.233	98.900	3.65000	27.3	
7	77.400	80.400	696.40	70.900	44.100	21729.33	27986.00	62472.67	399.67	.	3.60000	130.667	88.733	3.69667	27.2	
8	77.800	80.600	717.20	72.300	45.100	21464.67	27614.67	61366.00	1012.67	.	3.63333	114.900	73.133	3.76667	28.2	
9	78.500	81.000	738.50	71.900	44.700	22134.33	28679.33	64017.33	440.33	.	3.50000	91.233	60.067	3.80667	27.7	
10	79.100	81.200	750.00	74.200	46.600	21295.00	26879.33	57453.33	258.67	.	3.80000	130.500	86.267	3.83333	29.0	
11	79.800	81.700	760.60	73.700	45.900	19040.00	25823.67	59372.00	-242.00	.	4.36667	96.700	65.967	3.91333	28.6	
12	80.300	82.200	774.90	74.000	46.700	16432.33	22976.00	49376.00	748.00	.	3.80000	96.700	65.967	3.91333	29.1	
13	80.500	82.600	780.70	75.900	47.200	16107.67	22459.67	47684.33	844.67	.	3.50000	70.667	49.033	4.01667	29.2	
14	80.900	82.900	788.60	75.500	47.100	17515.00	24618.33	52082.33	1181.33	.	3.33333	123.700	84.900	4.02667	29.3	
15	81.600	83.400	805.70	75.800	47.100	19820.33	25598.67	53475.33	638.33	.	3.03333	124.867	81.400	4.14333	29.3	
16	82.300	83.900	823.30	77.100	48.000	21653.00	28862.00	59547.33	886.67	.	3.00000	111.300	65.933	4.24333	29.9	
17	83.400	84.400	841.20	79.200	49.300	22798.33	29122.67	59071.67	539.33	.	3.03333	97.233	59.967	4.31667	30.4	
18	84.200	85.000	867.20	79.700	49.800	23735.67	30429.00	60577.67	705.67	.	2.80000	146.933	88.733	4.32000	30.7	
19	85.000	85.600	884.90	79.800	49.600	24018.00	30605.00	60402.67	312.33	.	3.56667	136.867	83.000	4.42333	30.5	
20	85.900	86.400	900.30	82.500	51.300	25422.33	31842.67	61511.33	935.33	.	3.60000	121.433	68.067	4.56667	32.4	
21	86.800	87.100	921.20	84.800	52.800	26821.67	33843.33	63694.00	632.00	.	3.86667	107.833	57.033	4.59667	32.4	
22	87.900	87.900	937.40	86.700	53.600	26708.67	34176.00	63840.67	499.00	.	4.10000	153.933	86.333	4.70000	33.1	
23	88.900	88.800	955.30	87.100	54.200	25758.67	33542.67	61362.67	-75.67	.	4.03333	126.467	71.500	4.83000	33.3	
24	90.000	89.800	962.00	88.300	54.800	24872.00	31399.33	56951.67	304.33	.	4.13333	100.700	55.300	4.99667	33.6	
25	91.100	90.600	972.00	87.800	54.400	23531.00	31781.67	56676.00	131.67	.	4.03333	85.133	45.567	5.08000	33.5	
26	92.000	91.500	986.30	90.900	56.400	22947.00	30345.67	53663.67	921.67	.	3.83333	129.533	77.200	5.12333	35.0	
OBS	IPDNRS	IPDPX	YR	QT	POTADJ	DATE	Q	QN	QRT	IG	LIG	LFHDSLI	LLE6HCC	LCONNFR	LQRT	LQN
1	31.5	34.8	64	1	0.990	6401	0.75575	0.90517	0.76338	36.8058	.	.	.	.	.	.
2	31.5	34.9	64	2	0.990	6402	0.76504	0.90258	0.71277	34.5652	36.8058	.	.	.	.	.
3	31.6	35.0	64	3	0.990	6403	0.76000	0.90286	0.76768	33.4438	34.5652	.	.	.	.	.
4	31.5	35.1	64	4	0.990	6404	0.78063	0.89744	0.78851	32.5817	33.4438	.	.	.	.	.
5	31.9	35.4	65	1	0.989	6501	0.77119	0.90113	0.77976	32.7133	32.5817	778.67	3.53667	27274.00	0.76338	0.90517
6	31.9	35.6	65	2	0.989	6502	0.76685	0.89607	0.77538	32.0097	32.7133	1024.67	3.50667	28454.33	0.77277	0.90258
7	32.2	35.7	65	3	0.989	6503	0.76190	0.90196	0.77038	31.2024	32.0097	630.67	3.55667	27838.67	0.76768	0.90286
8	32.4	35.9	65	4	0.989	6504	0.78522	0.90251	0.79425	29.9284	31.2024	1096.00	3.61333	27986.00	0.78851	0.89744
9	32.8	36.3	66	1	0.987	6601	0.76309	0.90358	0.77314	29.9720	29.9284	636.00	3.66000	27614.67	0.77976	0.90113
10	33.2	36.6	66	2	0.987	6602	0.79235	0.90710	0.80279	28.3933	29.9720	789.33	3.65000	28679.33	0.77538	0.89607
11	33.4	36.9	66	3	0.987	6603	0.77507	0.90515	0.78528	25.0329	28.3933	399.67	3.69667	26879.33	0.77038	0.90196
12	34.0	37.2	66	4	0.987	6604	0.78495	0.91398	0.79528	21.2057	25.0329	1012.67	3.76667	25823.67	0.79425	0.90251
13	34.1	37.2	67	1	0.989	6701	0.78226	0.91667	0.79096	20.6323	21.2057	440.33	3.80667	22976.00	0.77314	0.90358
14	34.3	37.4	67	2	0.989	6702	0.78075	0.91711	0.78943	22.2102	20.6323	258.67	3.83333	22459.67	0.80279	0.90710
15	34.5	37.8	67	3	0.989	6703	0.77513	0.91270	0.78375	24.6001	22.2102	-242.00	3.91333	24618.33	0.78528	0.90515
16	34.8	38.1	67	4	0.989	6704	0.78478	0.91339	0.79351	26.3003	24.6001	748.00	3.98000	25598.67	0.79528	0.91398
17	35.3	38.6	68	1	0.988	6801	0.78756	0.91451	0.79713	27.1022	26.3003	844.67	4.01667	28862.00	0.79096	0.91667
18	35.7	39.1	68	2	0.988	6802	0.78517	0.91304	0.79470	27.3705	27.1022	1181.33	4.02667	29122.67	0.78943	0.91711
19	36.1	39.5	68	3	0.988	6803	0.77215	0.91392	0.78153	27.1421	27.3705	638.33	4.14333	30429.00	0.78375	0.91270
20	36.6	39.9	68	4	0.988	6804	0.80201	0.91729	0.81175	28.2376	27.1421	886.67	4.24333	30605.00	0.79351	0.91399
21	37.1	40.3	69	1	0.983	6901	0.80397	0.92060	0.81787	29.1160	28.2376	539.33	4.31667	31842.67	0.79713	0.91451
22	37.7	40.8	69	2	0.983	6902	0.81127	0.92402	0.82550	28.4923	29.1160	705.67	4.32000	33843.33	0.79470	0.91304

## Appendix A (continued)

23	38.2	41.3	69	3	0.983	69Q3	0.80630	0.92494	0.82024	26.9640	28.4923	312.33	4.42333	34176.00	0.78153	0.91392
24	38.7	41.7	69	4	0.983	69Q4	0.80576	0.92806	0.81969	25.8545	26.9640	935.33	4.54667	33542.67	0.81175	0.91729
25	39.3	42.3	70	1	0.982	70Q1	0.79384	0.93128	0.80839	24.2088	25.8545	632.00	4.59667	31399.33	0.81787	0.92060
26	39.9	42.7	70	2	0.982	70Q2	0.81967	0.93443	0.83470	23.2657	24.2088	499.00	4.70000	31781.67	0.82530	0.92402

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

OBS	GDC	GDCSH	GNP	HNPI	HNPR	CONH	CONNFR	COR77	FMSLSI	FYCPJM	HNRH	HS6FR	HS6P1	LE6HCC	PINDX
27	92.900	92.500	1003.60	89.500	54.900	24136.33	31093.00	56376.00	959.67	.	3.00000	133.467	76.267	5.3000	34.0
28	94.100	93.600	1009.00	89.000	55.300	26320.67	34484.33	62352.00	1659.67	.	2.73333	129.733	71.933	5.4367	34.3
29	95.000	94.800	1049.30	91.100	56.500	29690.00	37273.00	66003.33	3022.67	0.0000	0.00000	126.900	68.267	5.5167	35.1
30	96.100	96.000	1068.90	93.700	58.000	33783.67	41933.67	72331.00	2467.67	4.8967	2.43333	197.800	116.167	5.5833	35.9
31	97.000	97.000	1086.60	95.100	59.000	36913.00	45021.67	76261.00	1759.67	5.5900	2.90000	190.867	107.167	5.7333	36.8
32	97.700	97.900	1105.80	96.000	59.600	38702.00	47567.33	79452.00	2074.67	4.8233	2.96667	168.500	92.067	5.8733	37.5
33	98.800	98.700	1142.40	97.600	60.600	42731.33	51650.67	84993.00	3427.33	3.6633	2.83333	168.400	87.967	5.9367	37.9
34	99.500	99.500	1171.70	98.600	61.200	43684.67	53186.00	86575.67	2553.67	4.3233	2.96667	220.167	128.967	5.9633	38.3
35	100.400	100.400	1196.10	100.200	62.100	44755.00	54446.00	86695.00	2476.00	4.6667	3.20000	212.700	123.633	6.0667	38.8
36	101.300	101.400	1233.50	103.600	64.400	47979.67	57288.00	88084.67	2830.67	5.0600	3.36667	184.233	95.867	6.2733	40.3
37	102.800	102.800	1283.50	104.200	64.600	51617.67	62669.00	96316.67	2923.33	6.0867	3.86667	161.533	85.267	6.3267	41.0
38	104.800	104.000	1307.60	107.900	66.800	51358.33	60887.00	88593.33	1969.33	7.2867	4.56667	213.867	122.300	6.3900	41.4
39	106.800	105.400	1337.70	112.900	69.200	50577.33	60025.00	85558.33	150.00	9.8733	4.66667	182.733	102.000	6.4200	43.1
40	108.800	106.700	1376.70	113.100	70.100	46981.33	57025.67	80131.33	1703.00	9.5300	5.30000	123.600	67.767	6.5933	43.9
41	112.100	108.200	1387.70	115.600	71.800	43950.67	59505.00	73377.67	2728.00	10.7067	4.93333	152.033	99.267	6.5833	44.9
42	115.000	109.700	1423.80	118.300	73.400	42812.67	51614.67	69093.00	1008.00	10.7067	4.93333	152.033	99.267	6.5833	44.9
43	117.800	111.300	1451.60	121.000	75.200	40306.00	50360.67	65350.00	-67.00	11.7333	5.23333	112.000	81.300	6.9000	46.8
44	120.800	113.000	1473.80	123.800	77.000	37939.00	46400.00	58966.33	1687.00	9.4500	4.96667	75.633	56.133	7.1067	47.9
45	122.500	114.600	1479.80	128.200	80.000	32431.33	43251.33	53269.00	4326.67	6.6167	5.00000	63.667	47.433	7.1600	49.7
46	124.000	115.900	1516.70	130.000	81.100	31647.00	43677.67	53132.33	4295.67	5.6200	4.93333	108.100	86.967	7.2267	50.4
47	126.300	117.400	1578.50	131.500	82.000	34243.67	46912.67	56539.33	2719.00	6.3500	4.06667	116.167	89.333	7.3733	51.2
48	128.200	119.200	1621.80	134.500	84.000	38428.33	50830.00	60077.33	2927.33	5.6633	4.10000	98.867	73.667	7.4567	52.4
49	129.400	120.800	1672.00	137.200	85.400	42230.67	56294.67	65681.67	5426.00	4.8900	3.53333	93.600	73.000	7.4633	52.8
50	130.600	122.500	1698.60	140.900	88.000	45085.33	58764.67	66783.67	3605.33	5.1900	3.63333	146.433	113.200	7.5733	54.6
51	132.400	124.300	1729.00	143.800	90.800	47851.00	57611.33	64008.67	3736.00	5.1600	3.76667	144.767	111.200	7.7900	56.0
52	134.400	126.100	1772.50	147.200	92.100	52599.00	62339.33	74888.33	4094.33	4.7267	3.56667	127.633	90.033	7.9467	56.4

OBS	IPDHRS	IPDPCK	YR	QT	POTADJ	DATE	Q	QN	QRT	IG	LIG	LFHDSLI	LL6HCC	LCONNFR	LQRT	LQN
27	40.0	43.1	70	3	0.982	70Q3	0.78886	0.92807	0.80392	24.0498	23.2657	-75.67	4.8300	30345.67	0.82024	0.92494
28	40.2	43.6	70	4	0.982	70Q4	0.78670	0.92202	0.80112	26.0859	24.0498	304.33	4.9967	31023.00	0.81969	0.92806
29	41.3	44.2	71	1	0.989	71Q1	0.79412	0.93439	0.80295	28.2951	26.0859	131.67	5.0800	34484.33	0.80839	0.93128
30	42.2	44.7	71	2	0.989	71Q2	0.80313	0.94407	0.81206	31.6060	28.2951	921.67	5.1233	37273.00	0.83470	0.93443
31	42.8	45.2	71	3	0.989	71Q3	0.81416	0.94690	0.82321	33.9711	31.6060	959.67	5.3000	41933.67	0.80392	0.92807
32	43.4	45.7	71	4	0.989	71Q4	0.82057	0.94967	0.82970	34.9991	33.9711	1659.67	5.4367	45021.67	0.80112	0.92202
33	43.9	46.1	72	1	0.990	72Q1	0.82213	0.95228	0.83043	37.4049	34.9991	3022.67	5.5167	47567.33	0.80295	0.93439
34	44.3	46.5	72	2	0.990	72Q2	0.82366	0.95269	0.83198	37.2832	37.4049	2467.67	5.5833	51650.67	0.81206	0.94407
35	44.6	46.9	72	3	0.990	72Q3	0.82729	0.95096	0.83565	37.4174	37.2832	1759.67	5.7333	53186.00	0.82321	0.94690
36	44.7	47.3	72	4	0.990	72Q4	0.85210	0.94503	0.86061	38.8972	37.4174	2074.67	5.8733	54446.00	0.82970	0.94967
37	45.1	48.1	73	1	0.980	73Q1	0.85239	0.93763	0.86979	40.2163	38.8972	3427.33	5.9367	57288.00	0.83043	0.95228
38	45.8	49.1	73	2	0.980	73Q2	0.84318	0.92719	0.86038	39.2768	40.2163	2553.67	5.9633	62669.00	0.83198	0.95269
39	46.3	49.9	73	3	0.980	73Q3	0.86373	0.92786	0.88135	37.8839	39.2768	2476.00	6.0667	60087.00	0.83565	0.95096
40	46.8	51.1	73	4	0.980	73Q4	0.85910	0.91585	0.87663	34.1261	37.8839	2430.67	6.2733	60025.00	0.86061	0.94503
41	47.6	52.8	74	1	0.970	74Q1	0.85038	0.90152	0.87668	31.6716	34.1261	2923.33	6.3267	57025.67	0.86979	0.93763
42	49.0	54.1	74	2	0.970	74Q2	0.84473	0.90573	0.87086	30.0693	31.6716	1969.33	6.2900	53505.00	0.86038	0.93279
43	51.7	55.6	74	3	0.970	74Q3	0.84324	0.93153	0.86932	27.7666	30.0693	150.00	6.4200	51614.67	0.88135	0.92786
44	54.0	56.5	74	4	0.970	74Q4	0.84629	0.95406	0.87246	24.2862	27.7666	1703.00	6.5933	50360.67	0.87663	0.91585
45	56.2	57.7	75	1	0.973	75Q1	0.86135	0.97400	0.88525	21.9160	24.2862	2728.00	6.5833	46400.00	0.87668	0.90152
46	57.6	58.4	75	2	0.973	75Q2	0.85301	0.98630	0.88696	20.8657	21.9160	1008.00	6.6367	43251.33	0.87086	0.90573
47	58.5	59.7	75	3	0.973	75Q3	0.85762	0.97990	0.88142	21.6938	20.8657	-67.00	6.9000	40693.00	0.86932	0.93153
48	59.4	60.8	75	4	0.973	75Q4	0.86184	0.97697	0.88576	23.6949	21.6938	1687.00	7.1067	46912.67	0.87246	0.95406



Appendix A (continued)

49	60.3	61.4	76	1	0.985	7601	0.85993	0.98208	0.87303	25.2576	23.6949	4376.67	7.1600	50830.00	0.88525	0.97400
50	61.5	62.1	76	2	0.985	7602	0.87923	0.99034	0.89262	26.5426	25.2576	4295.67	7.2267	56294.67	0.88696	0.98630
51	62.4	63.0	76	3	0.985	7603	0.88889	0.99048	0.90243	27.6755	26.5426	2719.00	7.3733	58764.67	0.88142	0.97990
52	63.5	63.9	76	4	0.985	7604	0.88263	0.99374	0.89607	29.6750	27.6755	2927.33	7.4567	57611.33	0.88576	0.97697

Appendix A (continued)

The SAS System

14:33 Thursday, August 1, 1991

OBS	GDC	GDCSH	GNP	HNP1	HNPR	CONR	CONFR	COR77	FHDSLI	FYCP1M	HNHM	HS6FR	HS6P1	LE6HCC	PINDX
53	136.500	128.400	1834.80	152.600	95.500	57584.67	72056.00	75616.33	5390.67	4.6100	3.50000	122.467	89.567	7.9733	58.3
54	138.300	130.500	1895.10	158.300	99.100	65261.33	80676.00	81954.33	4042.00	5.0067	3.20000	193.700	146.700	7.9767	60.4
55	140.300	132.500	1954.40	160.800	100.800	67294.33	83211.67	80399.67	4322.33	5.6367	3.70000	187.167	136.767	8.1400	61.3
56	142.200	134.900	1988.90	170.000	106.600	70531.33	85205.00	82088.00	3250.33	6.4233	3.66667	159.033	110.600	8.2800	64.5
57	144.400	137.200	2031.70	171.700	108.100	69867.00	84667.00	78418.33	4185.33	6.5567	4.03333	120.667	85.833	8.3600	65.0
58	147.700	139.800	2139.50	178.700	112.400	76606.00	94592.33	84103.67	3211.67	7.0033	3.66667	208.167	149.700	8.4967	68.4
59	150.500	142.300	2202.50	186.500	117.300	77588.67	96084.67	82084.33	3941.33	7.8833	3.93333	187.867	134.633	8.7567	71.2
60	153.500	145.300	2281.60	192.900	121.000	77597.67	96061.00	79579.67	3616.33	9.6000	4.33333	156.733	107.633	8.9133	73.1
61	157.000	147.600	2335.50	198.000	124.700	76701.33	95582.67	77569.33	5290.67	9.8133	4.63333	108.533	75.533	9.0033	75.1
62	160.500	150.200	2377.90	206.600	130.800	78842.33	98564.67	76824.67	2569.67	9.7833	4.93333	180.633	128.967	9.1100	79.7
63	164.200	153.800	2454.80	212.900	134.100	81238.33	101542.33	76795.67	2876.67	10.6133	4.66667	166.067	114.300	9.3733	81.2
64	168.100	158.100	2502.90	216.200	137.100	77196.00	99029.67	73363.00	2564.33	13.2500	4.76667	126.433	79.233	9.5233	82.8
65	172.900	164.300	2578.80	228.500	144.600	57189.67	80193.67	56238.00	2825.33	11.4200	5.40000	101.433	67.767	9.7600	85.1
66	176.900	172.400	2736.00	234.300	148.100	67757.33	81984.00	56713.67	3547.00	9.6100	5.76667	129.433	90.867	10.0600	89.4
67	181.100	178.000	2823.90	242.600	153.700	71587.00	96302.33	63835.33	2860.67	15.8967	4.33333	88.067	55.500	10.4633	94.0
68	185.300	182.400	2875.80	248.700	157.300	68620.00	91613.67	60069.00	-296.33	16.6800	5.16667	112.900	76.633	10.5733	96.2
69	189.200	186.600	2918.00	256.500	161.100	62466.67	84127.33	53726.33	-949.33	17.0767	5.36667	90.100	61.600	10.9500	97.8
70	192.700	180.600	3009.30	260.400	165.400	60466.67	84127.33	53726.33	3164.67	13.1033	5.83333	70.300	41.367	11.2300	99.5
71	196.400	185.200	3009.30	260.400	165.400	60466.67	84127.33	53726.33	3164.67	13.1033	5.83333	70.300	41.367	11.2300	99.5
72	199.800	190.400	3027.90	256.500	161.100	52615.67	77016.67	48127.67	3495.00	13.8367	4.90000	58.900	37.867	11.4933	99.3
73	202.500	193.900	3026.00	256.500	161.100	52615.67	77016.67	48127.67	3495.00	13.8367	4.90000	58.900	37.867	11.4933	99.3
74	204.500	196.900	3061.20	263.900	163.800	49128.00	73741.67	46311.33	858.00	14.0433	4.10000	91.333	59.400	11.4533	100.9

OBS	IPDNRS	IPDPCK	YR	QT	POTADJ	DATE	Q	QN	QRT	IG	LIG	LFMSLI	LLE6HCC	LCONFR	LQRT	LQN
53	64.2	65.0	77	1	0.987	77Q1	0.89692	0.98769	0.90874	31.3847	29.6750	5426.00	7.4633	69235.33	0.87303	0.98208
54	65.4	66.3	77	2	0.987	77Q2	0.91101	0.98643	0.92301	34.8369	31.3847	3605.33	7.5733	72056.00	0.89262	0.99034
55	66.5	67.3	77	3	0.987	77Q3	0.91085	0.98811	0.92284	34.4322	34.4322	4094.33	7.9900	80676.00	0.90243	0.99048
56	68.1	68.3	77	4	0.987	77Q4	0.94436	0.99707	0.95680	35.4625	34.4322	4094.33	7.9467	83211.67	0.89607	0.99374
57	69.2	69.3	78	1	0.982	78Q1	0.93795	0.99856	0.95514	34.3884	35.4625	5390.67	7.9733	85205.00	0.90874	0.98769
58	70.8	70.9	78	2	0.982	78Q2	0.96474	0.99859	0.98242	35.8056	34.3884	4042.00	7.9767	84667.00	0.92301	0.98643
59	72.2	72.3	78	3	0.982	78Q3	0.98479	0.99862	1.00284	35.2275	35.8056	4322.33	8.1400	94592.33	0.92284	0.98811
60	73.7	73.7	78	4	0.982	78Q4	0.99186	1.00000	1.01004	34.0102	35.2275	3250.33	8.2800	96084.67	0.95680	0.99707
61	75.3	75.2	79	1	0.970	79Q1	1.00665	1.00133	1.03778	32.8415	34.0102	4185.33	8.3600	96061.00	0.95514	0.99856
62	77.0	77.1	79	2	0.970	79Q2	1.03372	0.99870	1.06569	33.1563	32.8415	3211.67	8.4967	96582.67	0.98242	0.99859
63	78.7	79.2	79	3	0.970	79Q3	1.05225	0.99369	1.05696	33.0937	33.1563	3941.33	8.7567	98664.67	1.00284	0.99862
64	80.0	81.1	79	4	0.970	79Q4	1.02096	0.98644	1.05254	30.8426	33.0937	3616.33	8.9133	101542.33	1.01004	1.00000
65	82.2	83.5	80	1	0.956	80Q1	1.01916	0.98443	1.06607	27.6703	30.8426	5290.67	9.0033	99029.67	1.03778	1.00133
66	84.2	85.5	80	2	0.956	80Q2	0.67251	0.98480	0.70347	22.1769	27.6703	2569.67	9.1100	95910.00	1.06569	0.99870
67	86.3	87.6	80	3	0.956	80Q3	1.02055	0.98516	1.06752	22.0830	22.1769	2676.67	9.3733	80193.67	1.05696	0.99369
68	87.9	89.8	80	4	0.956	80Q4	1.01002	0.97884	1.05651	24.7651	22.0830	2564.33	9.5233	81984.00	1.05254	0.98644
69	90.2	92.1	81	1	0.955	81Q1	1.02063	0.97937	1.06872	24.8929	24.7651	2808.33	9.5767	93031.67	1.06607	0.98443
70	92.2	93.8	81	2	0.955	81Q2	1.02559	0.98294	1.07391	23.5161	24.8929	2925.33	9.7600	96302.33	1.07037	0.98480
71	94.4	95.5	81	3	0.955	81Q3	1.02408	0.98848	1.07324	20.9933	23.5161	3547.00	10.0600	91613.67	1.06752	0.98516
72	96.8	97.0	81	4	0.955	81Q4	1.02577	0.99794	1.07411	17.3770	20.9933	4750.67	10.3000	84127.33	1.05651	0.97884
73	98.7	98.3	82	1	0.963	82Q1	1.01017	1.00407	1.04899	16.4478	17.3770	2860.67	10.4633	77016.67	1.06872	0.97937
74	99.9	99.2	82	2	0.963	82Q2	1.01714	1.00706	1.05622	16.0486	16.4478	-296.33	10.5733	70420.00	1.07391	0.98294

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
GDC	IMPLICIT PR DEFLATOR: PERSONAL CONSUMPTI	74	117.8918919	38.3360864	75.6000061	204.5000000
GDCSH	IMPLICIT PRICE DEFL. PCE: HOUSING	74	114.3013506	33.4933672	78.8999939	196.8999939
GNP	GROSS NATIONAL PRODUCT, TOTAL	74	1491.73	734.6956396	625.3000488	3061.20
HNPI	NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1	72	126.2583334	56.2763171	67.6999969	256.5000000
HNPR	NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1	74	81.3013526	37.8938876	42.3000031	163.8000031
CONH	CONSTRUCT.PUT IN PLACE: NEW HOUSING UNIT	74	42090.50	19702.16	16107.67	81238.33
CONNFR	CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL	74	54084.92	25161.01	22459.67	101542.33
COR77	CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL	74	66678.00	11850.92	43810.00	96316.67
FHDSLI	NET INFLOH OF SAVINGS: ALL OPER.SAVINGS	74	2031.33	1971.99	-949.3333333	5426.00
FYCPIM	INTEREST RATE: COMMERCIAL PAPER, 1-MONTH	46	8.4482609	4.0093956	0	17.0766662
HMM	NEW 1-FAMILY HOUSES. MEDIUM NUMBER OF MO	74	4.0072072	0.8249214	2.4333334	6.3999999
HS6ER	HOUSING STARTS: TOTAL NEW PRIV HOUSING U	74	130.3369374	38.9921029	58.8999990	220.1666718
HS6P1	HOUSING STARTS: NEW PRIV 1 UNIT STRUCTUR	74	83.5207206	25.5312772	37.8666687	149.6999969
LE6HCC	AVG HR EARNINGS OF CONSTR WKRS: CONSTRUC	74	6.5970270	2.3258225	3.5066665	11.4933332
PINDX	CENSUS BUREAU CONSTANT QUALITY HS. INDX.	74	49.6297297	22.5002267	26.3000000	100.9000000
IPDNRS	NON-RES. STRUCTURES DEFLATOR	74	53.6108108	20.3403746	31.5000000	99.9000000
IPDPCX	CONSUMPTION DEFLATOR	74	55.8310811	19.2438635	34.8000000	99.2000000
YR	YEAR	74	72.7567568	5.3808662	64.0000000	82.0000000
QT	QUARTER	74	2.4729730	1.1253368	1.0000000	4.0000000
POTADJ	POTERBA'S ADJUSTMNT FCTR, (1984, 740)	74	0.9798108	0.0110809	0.9550000	0.9900000
DATE	DATE	74	4793.53	1963.74	1461.00	8126.00
Q	HS PRC INDX / PERS CONSUMPT DEFLATOR	74	0.8613216	0.0921370	0.6725146	1.0337224
QN	PRICE OF ALT OUTPUTS / CONSUMPT DEFLATOR	74	0.9494142	0.0366854	0.8960674	1.0070565
QRT	PRICE ADJUSTED BY POTERBA FACTOR	74	0.8798955	0.1019376	0.7034672	1.0741081
IG	CONST PUT IN PLACE/GNP	74	28.9477217	5.7936688	16.0486086	40.2163355
LIG	LAG(IG)	73	29.1244219	5.6294060	16.4477859	40.2163355
LFHDSLI	LAG4(FHDSLI)	70	2053.57	1554.20	-296.3333333	5426.00
LLEGHCC	LAG4(LEGHCC)	70	6.3293333	2.0917482	3.5066665	10.5733331
LCNNFR	LAG(CONNFR)	73	53815.65	25227.54	22459.67	101542.33
LQRT	LAG4(QRT)	70	0.8694373	0.0945220	0.7034672	1.0739124
LQN	LAG4(QN)	70	0.9465586	0.0356073	0.8960674	1.0013298

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

CONTENTS PROCEDURE

Data Set Name: MORK.TEMP  
 Member Type: DATA  
 Engine: V606  
 Created: 14:33 Thursday, August 1, 1991  
 Last Modified: 14:33 Thursday, August 1, 1991  
 Data Set Type:  
 Observations: 74  
 Variables: 31  
 Indexes: 0  
 Observation Length: 248  
 Deleted Observations: 0  
 Compressed: YES  
 Reuse Space: YES

Label:

-----Engine/Host Dependent Information-----

Data Set Page Size: 3072  
 Number of Data Set Pages: 7  
 Userid : U31077  
 File : TEMP MORK

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Format	Label
6	CONH	Num	8	40		CONSTRUCT.PUT IN PLACE: NEW HOUSING UNIT
7	CONNFR	Num	8	48		CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL
8	COR77	Num	8	56		CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL
21	DATE	Num	8	160	YYQ4.	
9	FNDSLI	Num	8	64		NET INFLOW OF SAVINGS: ALL OPER.SAVINGS
10	FYCP1H	Num	8	72		INTEREST RATE: COMMERCIAL PAPER, 1-MONTH
1	GDC	Num	8	0		IMPLICIT PR DEFLATOR: PERSONAL CONSUMPTI
2	GDCSH	Num	8	8		IMPLICIT PRICE DEFL. PCE: HOUSING
3	GHP	Num	8	16		GROSS NATIONAL PRODUCT, TOTAL
4	HHP1	Num	8	80		NEW 1-FAMILY HOUSES, MEDIUM NUMBER OF MO
5	HNPR	Num	8	24		NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1
12	HS6FR	Num	8	32		NEW 1-FAMILY HOUSES SOLD, PRICE INDEX (1
13	HS6P1	Num	8	88		HOUSING STARTS: TOTAL NEW PRIVY HOUSING U
25	IG	Num	8	96		HOUSING STARTS: NEW PRIVY 1 UNIT STRUCTUR
16	IPDNRS	Num	8	192		CONST PUT IN PLACE/GNP
17	IPDPCX	Num	8	120		NON-RES. STRUCTURES DEFLATOR
29	LCONNFR	Num	8	128		CONSUMPTION DEFLATOR
14	LE6HCC	Num	8	104		LAG(CONNFR)
27	LFNDSLI	Num	8	208		AVG HR EARNINGS OF CONSTR MKRS: CONSTRUC
26	LIG	Num	8	200		LAG(IG)
28	LLE6HCC	Num	8	216		LAG4(LE6HCC)
31	LQN	Num	8	240		LAG4(QN)
30	LQRT	Num	8	232		LAG4(QRT)
15	PINDX	Num	8	112		CENSUS BUREAU CONSTANT QUALITY HS. INDX.
20	POTADJ	Num	8	152		POTERBA'S ADJUSTHT FCTR, (1984, 740)
22	Q	Num	8	168		HS PRC INDX / PERS CONSUMPT DEFLATOR
23	QN	Num	8	176		PRC OF ALL OUTPUTS / CONSUMPT DEFLATOR
24	QRT	Num	8	184		PRICE ADJUSTED BY POTERBA FACTOR
19	QT	Num	8	144		QUARTER
18	YR	Num	8	136		YEAR

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

Model: MODEL1  
 Dependent Variables: CONHFR CONSTRUCT.PUT IN PLACE: PRIV RESIDENTIAL

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	3	39709753664	13236584621	142.442	0.0001
Error	70	6504808885.8	92925841.226		
C Total	73	46214562750			

Root MSE 9639.80504 R-square 0.8592  
 Dep Mean 54084.92342 Adj R-sq 0.8532  
 C.V. 17.82346

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-69048	16050.479938	-4.302	0.0001	Intercept
GR1	1	96406	25366.354544	3.801	0.0003	PRICE ADJUSTED BY POTERBA FACTOR
LE6HCC	1	4982.377747	1193.6389109	4.174	0.0001	AVG HR EARNINGS OF CONSTR MKRS: CONSTRUC
FHDSL1	1	2.676495	0.86943000	3.078	0.0030	NET INFLOW OF SAVINGS: ALL OPER.SAVINGS

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System  
Dunbr-Matson D            0.547  
(For Number of Obs.)    74  
1st Order Autocorrelation 0.698

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

SYSLIN Procedure  
Two-Stage Least Squares Estimation

Model:  
Dependent variables: LCONFR LAG(CONFR)

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	3	39389003809	13129667936	196.405	0.0001
Error	66	4412099916.7	66849998.738		
C Total	69	43801103725			

Root MSE 8176.18485 R-Square 0.8993  
Dep Mean 54904.75238 Adj R-SQ 0.8947  
C.V. 14.89158

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-31813	13661	-2.329	0.0229	Intercept
QRT	1	37063	21426	1.730	0.0883	PRICE ADJUSTED BY POTERBA FACTOR
LLE6HCC	1	6890.729864	1085.226856	6.350	0.0001	LAG4(LLE6HCC)
LFDHSLI	1	4.999163	0.878945	5.688	0.0001	LAG4(FDHSLI)

Durbin-Watson (For Number of Obs.) 0.788  
70  
1st Order Autocorrelation 0.598

The SAS System

Autoreg Procedure

Dependent Variable = LCONNFR LAG(CONNFR)

Ordinary Least Squares Estimates

SSE	4.4121E9	DFE	66
MSE	66849999	Root MSE	8176.185
SBC	1472.784	AIC	1463.79
Reg Req	0.8993	Total Req	0.8993
Durbin-Watson	0.7882		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-31812.6703	13661	-2.329	0.0229
QRT	1	37062.7533	21426	1.730	0.0883
LLE6HCC	1	6890.7299	1085	6.350	0.0001
LFHDSL1	1	4.9991627194	0.878945	5.688	0.0001

Covariance of B-Values

	Intercept	QRT	LLE6HCC	LFHDSL1
Intercept	186628506.6	-284036214.4	9676401.9	2306.8
QRT	-284036214.4	459057556.1	-18647135.2	-2274.9
LLE6HCC	9676401.9	-18647135.2	1177717.3	-296.7
LFHDSL1	2306.8	-2274.9	-296.7	0.8

Correlation of B-Values

	Intercept	QRT	LLE6HCC	LFHDSL1
Intercept	1.0000	-0.9704	0.6527	0.1921
QRT	-0.9704	1.0000	-0.8020	-0.1208
LLE6HCC	0.6527	-0.8020	1.0000	-0.3110
LFHDSL1	0.1921	-0.1208	-0.3110	1.0000

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1	0	1	2	3	4	5	6	7	8	9	1
0	63029999	1.000000												
1	37673702	0.597711												
2	26892392	0.426660												
3	22992096	0.364780												
4	27045355	0.429087												



## Appendix A (continued)

Partial Autocorrelations  
1 0.597711  
2 0.107978  
4 0.235889

Appendix A (continued)

The SAS System

Autoreg Procedure

Gamma Inverse

GINV	A(1)	A(2)	A(4)
A(1)	2.5262937E-8	-1.365955E-8	-3.389992E-9
A(2)	-1.365955E-8	2.6775521E-8	-6.443504E-9
A(4)	-3.389992E-9	-6.443504E-9	1.985125E-8

Preliminary MSE = 37236647

Estimates of the Autoregressive Parameters

Lag	Coefficient	Std Error	t Ratio
1	-0.49288815	0.12219598	-4.033587
2	-0.03141112	0.12580097	-0.249689
4	-0.23588932	0.10832007	-2.177706

Expected Autocorrelations

Lag	Autocorr
0	1.0000
1	0.5992
2	0.4276
3	0.3709
4	0.4322

Cholesky Root of Gamma

	1	2	3	4
1	1.302681054	0.00000000	0.00000000	0.00000000
2	0.780581318	1.042914539	0.00000000	0.00000000
3	0.557063205	0.558066209	1.036928455	0.00000000
4	0.483219577	0.334143879	0.541204398	1.029039570

Coefficients for first nlag obs

	1	2	3	4
1	0.7676476117	0.0000000000	0.0000000000	0.0000000000
2	-0.5745546372	0.9588513372	0.0000000000	0.0000000000
3	-0.1031784887	-0.5160457584	0.9643866897	0.0000000000
4	-0.1196433944	-0.0399479986	-0.5072014065	0.9717799284

Iteration Number 1 SSE = 1.8117E9

Appendix A (continued)

14:33 Thursday, August 1, 1991

The SAS System

Autoreg Procedure

Yule-Walker Estimates

SSE	1.8117E9	DFE	63
MSE	28757083	Root MSE	5362.563
SBC	1423.966	AIC	1408.226
Reg Req	0.6201	Total Req	0.9586

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	1896.83785	10475	0.181	0.8569
QRT	1	-8520.17266	12741	-0.669	0.5061
LLE6HCC	1	8416.50492	1135	7.413	0.0001
LFMDSL	1	3.15990	0.724849	4.359	0.0001

Covariance of B-Values

	Intercept	QRT	LLE6HCC	LFMDSL
Intercept	109734546.4	-100837626.0	-2538777.2	1298.9
QRT	-100837626.0	162340604.4	-6244595.6	-1906.8
LLE6HCC	-2538777.2	-6244595.6	1289222.3	-95.7
LFMDSL	1298.9	-1906.8	-95.7	0.5

Correlation of B-Values

	Intercept	QRT	LLE6HCC	LFMDSL
Intercept	1.0000	-0.7555	-0.2134	0.1711
QRT	-0.7555	1.0000	-0.4316	-0.2065
LLE6HCC	-0.2134	-0.4316	1.0000	-0.1163
LFMDSL	0.1711	-0.2065	-0.1163	1.0000

Expected Autocorrelations

Lag	Autocorr
0	1.0000
1	0.5992
2	0.4276
3	0.3709
4	0.4322

Cholesky Root of Gamma

	1	2	3	4
1	1.302681054	0.000000000	0.000000000	0.000000000

Appendix A (continued)

2	0.780581318	1.042914539	0.000000000	0.000000000
3	0.557063205	0.558066209	1.036928455	0.000000000
4	0.483219577	0.334143879	0.541204398	1.029039570

14:33 Thursday, August 1, 1991

The SAS System

Autoreg Procedure

Coefficients for first nlag obs

	1	2	3	4
1	0.7676476117	0.0000000000	0.0000000000	0.0000000000
2	-.5745546372	0.9588513372	0.0000000000	0.0000000000
3	-.1031784887	-.5160457584	0.9643866897	0.0000000000
4	-.1196433944	-.0399479986	-.5072014065	0.971779284

Appendix A (continued)

Appendix A (continued)

The SAS System 10:21 Tuesday, August 13, 1991

Variable Label	N	Mean	Std Dev	Minimum	Maximum
YR	100	1938.50	29.0114920	1889.00	1988.00
T	100	886810.00	618689.96	93000.00	2378500.00
TPUS1	100	897133.00	618119.68	93000.00	2378500.00
DIST	99	228511.71	194401.34	5000.00	774639.27
SLOPE	98	-1.0973390	6.5823049	-49.2500000	6.1568627
D	100	10323.00	211595.44	-705000.00	697000.00
CH	100	14.8811585	15.9094501	0	72.6654298
E	100	774640.00	0.000290115	774640.00	774640.00
L2CH	99	3.1055894	1.6967788	-2.2782822	6.1831973
L2E	100	19.5631665	0	19.5631665	19.5631665
DN	99	0.1587979	0.0867333	-0.1164577	0.3160632
SLOPEDN	97	-972466989	107461698285	-3.018823E11	313203468312



## Appendix A (continued)

52	1940	603000	706000	135473.24	1.1705	103000	10.6164	774640.00	3.40822	19.5632	0.17422	-12192715708.6
53	1941	706000	356000	364841.06	-3.3981	-350000	36.0750	774640.00	5.17293	19.5632	0.26442	-94758082929.3
54	1942	356000	191000	386943.15	0.4714	-165000	17.0068	774640.00	4.08804	19.5632	0.20897	58243196105.6
55	1943	191000	142000	172122.05	0.2970	-49000	5.0505	774640.00	2.33643	19.5632	0.11943	94054759841.4
56	1944	142000	326000	190412.71	-3.7951	184000	18.9652	774640.00	4.24528	19.5632	0.21700	-102497921356.9





Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BADTOT DEPENDENT ON ACTUAL TOTAL

Model: MODEL1  
 Dependent Variable: BADTOT

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	1.055985E12	1.055985E12	118.249	0.0001
Error	12	10712312209	8926926850.7		
C Total	13	1.1627216E12			

Root MSE 94482.41556 R-square 0.9079  
 Dep Mean 1023000.00000 Adj R-sq 0.9002  
 C.V. 9.23582

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-34882	100507.23776	-0.347	0.7346	Intercept
T	1	0.780231	0.07175051	10.874	0.0001	CURRENT YEAR HOUSING PRODUCTION

Appendix A (continued)

16:07 Wednesday, August 7, 1991

1BADTOT DEPENDENT ON ACTUAL TOTAL

Durbin-Watson D 0.155  
 (For Number of Obs.) 14  
 1st Order Autocorrelation 0.794

Obs	Dep Var BADTOT	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2-1-0 1 2	Cook's D
1	209300	219473	78088.28	-10173.2	53189.73	-0.191		0.039
2	670500	763294	34756.57	-92794.4	87857.31	-1.056		0.087
3	849000	954451	26026.44	-105451	90827.04	-1.161	**	0.055
4	931600	1027793	25255.33	-96192.8	91044.47	-1.057	**	0.043
5	1025100	1108937	26459.25	-83836.9	90701.90	-0.924	*	0.036
6	1396000	1488129	49671.06	-92129.3	80372.34	-1.146	**	0.251
7	1091300	1128443	27049.23	-37142.7	90527.71	-0.410		0.008
8	1127000	1138586	27397.45	-11585.7	90422.93	-0.128		0.001
9	1103800	1087090	25930.18	16709.6	90854.57	0.184		0.001
10	1220400	1175257	28873.56	45143.4	89962.46	0.502	*	0.013
11	1329000	1249379	32726.48	79621.5	88633.54	0.898	*	0.055
12	1118000	1017650	25256.28	100350	91044.20	1.102	**	0.047
13	1042000	920121	26965.62	121879	90552.65	1.346	**	0.080
14	1209000	1043397	25321.06	165603	91026.21	1.819	***	0.128

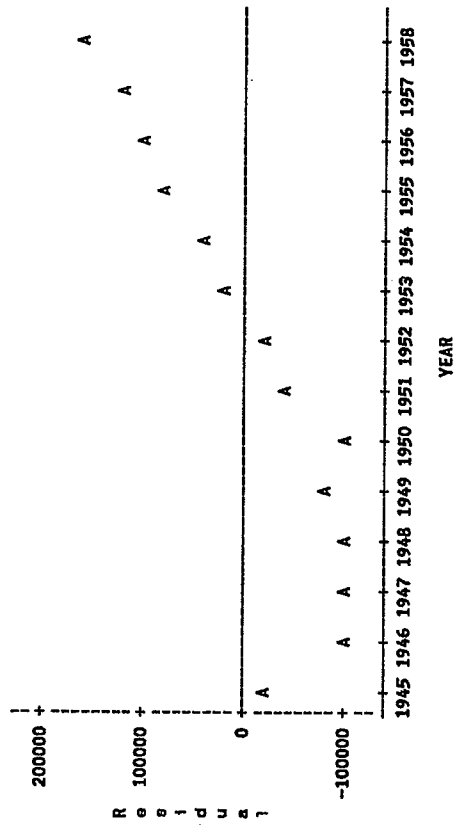
Sum of Residuals 0  
 Sum of Squared Residuals 10712312209  
 Predicted Resid SS (Press) 134692663447

Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BADTOT DEPENDENT ON ACTUAL TOTAL

Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.

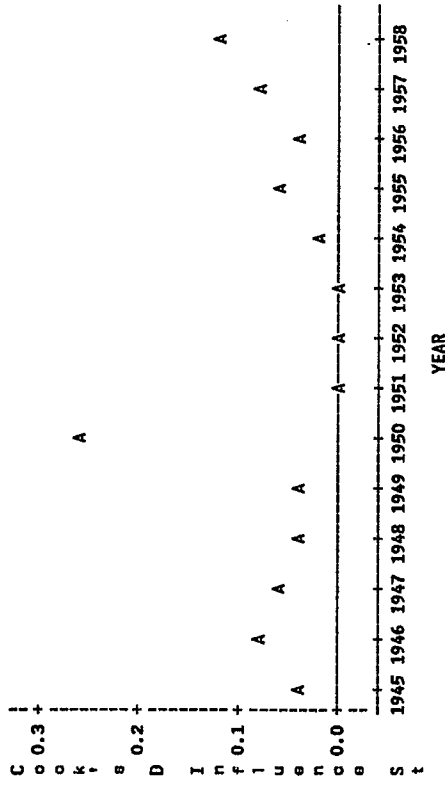


Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BADTOT DEPENDENT ON ACTUAL TOTAL

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.



## Appendix A (continued)

16:07 Wednesday, August 7, 199 1

OBS	YR	T	BADTOT	BSINGL	PRED	L95	U95	RESID	C00KD
1	1945	326000	209300	184600	219473.23	-47595.82	486542.28	-10173.23	0.03942
2	1946	1023000	670500	590000	763294.44	543947.65	982641.24	-92794.44	0.08729
3	1947	1268000	849000	740200	954451.11	740923.78	1167978.44	-105451.11	0.05534
4	1948	1362000	931600	766600	1027792.85	814705.55	1240880.15	-96192.85	0.04295
5	1949	1466000	1025100	794300	1108936.90	895157.20	1322716.61	-83836.90	0.03635
6	1950	1952000	1396000	1154100	1488129.31	1255555.20	1720703.42	-92129.31	0.25093
7	1951	1491000	1091300	900100	1128442.69	914312.75	1342572.62	-37142.69	0.00751
8	1952	1504000	1127000	942500	1138585.69	924245.70	1352925.68	-11585.69	0.00075
9	1953	1438000	1103800	937800	1087090.43	873618.70	1300562.16	16709.57	0.00138
10	1954	1551000	1220400	1077900	1175256.56	959998.70	1390514.43	45143.44	0.01297
11	1955	1646000	1329000	1194000	1249378.54	1031519.27	1467237.80	79621.46	0.05501
12	1956	1349000	1118000	990000	1017649.84	804562.01	1230737.68	100350.16	0.04675
13	1957	1224000	1042000	873000	920120.93	706041.07	1134200.79	121879.07	0.08032
14	1958	1382000	1209000	975000	1043397.48	830273.15	1256521.80	165602.52	0.12806

Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BADTOT DEPENDENT ON ACTUAL TOTAL

Autoreg Procedure

Dependent Variable = BADTOT

Ordinary Least Squares Estimates

SSE	1.071E11	DFE	12
MSE	8.9269E9	Root MSE	94482.42
SBC	363.623	AIC	362.3449
Reg Req	0.9079	Total Req	0.9079
Durbin-Watson	0.1547		

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	-36882.1702	1.01E+05	-0.367	0.7346
T	1	0.7802312919	7.18E-02	10.874	0.0001

Covariance of B-Values

Intercept	T
Intercept	10101704841
T	-6980
	0

Correlation of B-Values

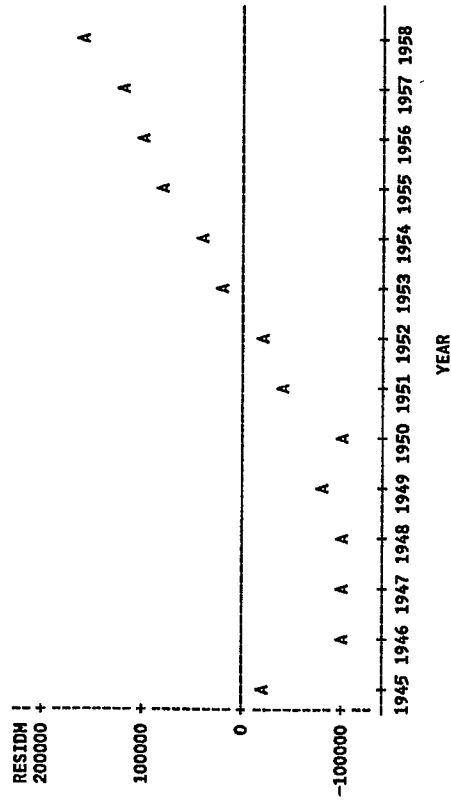
Intercept	T
Intercept	1.0000
T	-0.9679
	1.0000

Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BADTOT DEPENDENT ON ACTUAL TOTAL

Plot of RESID#\*YR. Legend: A = 1 obs, B = 2 obs, etc.





## Appendix A (continued)

16:07 Wednesday, August 7, 199 1

## BSINGL DEPENDENT ON BADTOT

Model: MODEL1  
Dependent Variable: BSINGL

## Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob > F
Model	1	826837498160	826837498160	510.032	0.0001
Error	12	19453785411	1621148784.3		
C Total	13	846291283571			

Root MSE 40263.49195 R-square 0.9770  
 Dep Mean 865721.42857 Adj R-sq 0.9751  
 C.V. 4.65086

## Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T
INTERCEP	1	3045.171074	39685.528543	0.077	0.9401
BADTOT	1	0.843281	0.03733994	22.584	0.0001

Appendix A (continued)

16:07 Wednesday, August 7, 1991

1BSINGL DEPENDENT ON BAOTOT

Durbin-Watson D 0.755  
 (For Number of Obs.) 14  
 1st Order Autocorrelation 0.564

Obs	Dep Var BSINGL	Predict Value	Std Err Predict	Residual	Std Err Residual	Student Residual	-2 -1 0 1 2	Cook's D
1	184600	179544	32232.81	5056.2	24128.72	0.210		0.039
2	590000	568465	17001.27	21535.1	36498.02	0.590	*	0.038
3	740200	718991	12570.17	21209.4	38251.01	0.554	*	0.017
4	766600	788646	11289.11	-22045.6	38648.48	-0.570	*	0.014
5	794300	867492	10761.16	-73192.3	38798.79	-1.886	***	0.137
6	1154100	1180265	17600.56	-26165.2	36212.83	-0.723	*	0.062
7	900100	923318	11058.95	-23217.5	38714.96	-0.600	*	0.015
8	942500	953423	11440.14	-10922.6	38604.04	-0.283		0.004
9	937800	933859	11175.82	3941.5	38681.39	0.102		0.000
10	1077900	1032185	13043.26	45714.9	38092.29	1.200	***	0.084
11	1194000	1123765	15695.55	70234.6	37078.28	1.894	***	0.321
12	990000	945833	11330.47	44166.9	38636.37	1.143	***	0.056
13	873000	881744	10784.23	-8743.8	38792.38	-0.225		0.002
14	975000	1022572	12807.52	-47571.7	38172.19	-1.246	***	0.087

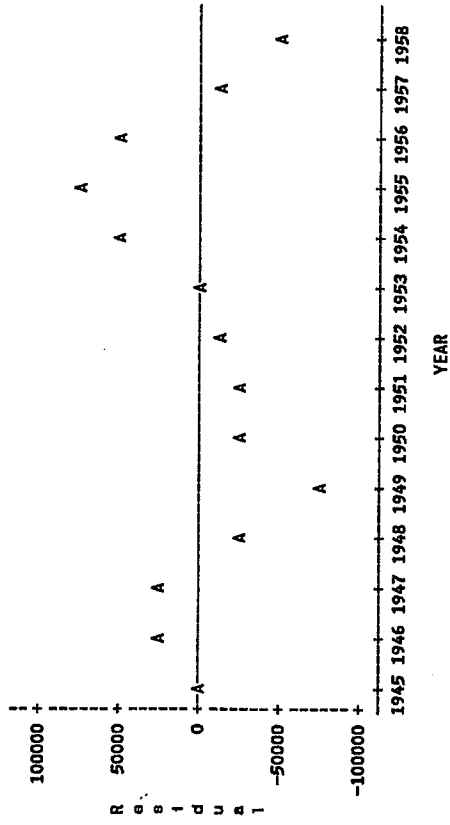
Sum of Residuals 0  
 Sum of Squared Residuals 19453785411  
 Predicted Resid SS (Press) 24717574739

Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BSINGL DEPENDENT ON BADTOT

Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.

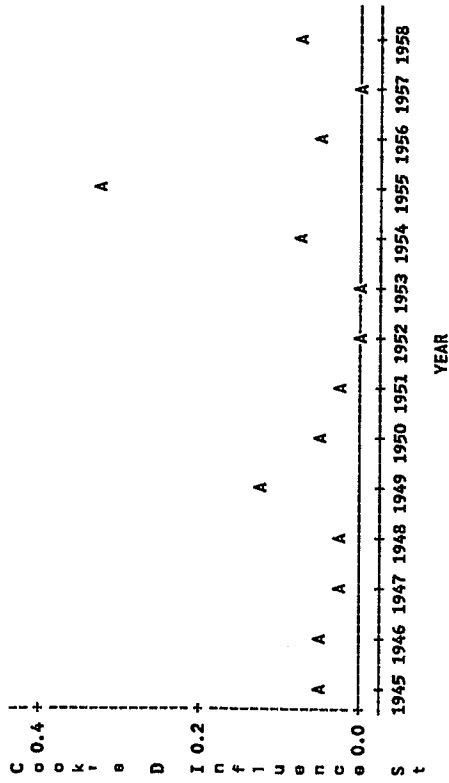


Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BSINGL DEPENDENT ON BADTOT

Plot of COOKD\*YR. Legend: A = 1 obs, B = 2 obs, etc.



## Appendix A (continued)

16:07 Wednesday, August 7, 199 1

OBS	YR	T	BADTOT	BSINGL	PRED	L95	U95	RESID	COOKD
1	1945	326000	209300	184600	179543.84	67168.83	291918.85	5056.16	0.03918
2	1946	1023000	670500	590000	568464.95	473238.17	663691.72	21535.05	0.03777
3	1947	1268000	849000	740200	718990.57	627087.96	810893.18	21209.43	0.01660
4	1948	1362000	931600	766600	788645.56	697535.80	879755.32	-22045.56	0.01388
5	1949	1466000	1025100	794300	867492.32	776686.35	958298.28	-73192.32	0.13688
6	1950	1952000	1396000	1154100	1180265.17	1084522.91	1276007.43	-26165.17	0.06166
7	1951	1491000	1091300	900100	923317.51	832341.85	1014293.17	-23217.51	0.01467
8	1952	1504000	1127000	942500	953422.63	862223.48	1044621.78	-10922.63	0.00352
9	1953	1436000	1103800	937800	933858.52	842815.08	1024901.95	3941.48	0.00043
10	1954	1551000	1220400	1077900	1032185.06	939970.02	1124400.09	45714.94	0.08443
11	1955	1646000	1329000	1194000	1123765.35	1029608.75	1217921.95	70234.65	0.32148
12	1956	1349000	1118000	990000	945833.10	854698.97	1036967.24	44166.90	0.05619
13	1957	1224000	1042000	873000	881743.76	790924.80	972562.72	-8743.76	0.00196
14	1958	1382000	1209000	975000	1022571.66	930513.62	1114629.70	-47571.66	0.08742

Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BSINGL DEPENDENT ON BADTOT

Autoreg Procedure

Dependent Variable = BSINGL

Ordinary Least Squares Estimates

SSE 1.945E10 DFE 12  
 MSE 1.6211E9 Root MSE 40263.49  
 SBC 339.7399 AIC 338.4618  
 Reg Rq 0.9770 Total Rq 0.9770  
 Durbin-Hatton 0.7548

Variable	DF	B Value	Std Error	t Ratio	Approx Prob
Intercept	1	3045.17107	39686	0.077	0.9401
BADTOT	1	0.8432807991	0.03734	22.584	0.0001

Covariance of B-Values

	Intercept	BADTOT
Intercept	1574941176	-1426
BADTOT	-1426	0

Correlation of B-Values

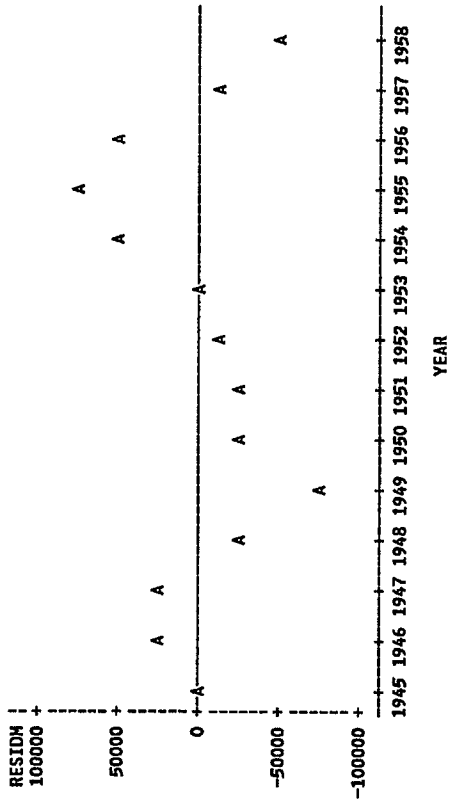
	Intercept	BADTOT
Intercept	1.0000	-0.9625
BADTOT	-0.9625	1.0000

Appendix A (continued)

16:07 Wednesday, August 7, 199 1

BSINGL DEPENDENT ON BADTOT

Plot of RESID\*YR. Legend: A = 1 obs, B = 2 obs, etc.



## Appendix B

### DATA AND GRAPHICS SOURCE FILES

In order that this work more easily be replicated and checked, and to provide my readers access to SAS graphics commands without requiring them to spend hours of trial and error, the following appendix is offered. It is my firm belief that scholarship--and the effective communication of ideas--would be strengthened if we only shared more of our computer code with one another.



## Appendix B (continued)

```

/*SOURCE FILE FDSUBPI SAS. REFID = FDSUBPI*/
%x8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 1.5 F = XSWISS C = RED
  'PERCENTAGE OF FEDERAL TRANSFERS FOR HOUSING';
TITLE3 H = 1 F = XSWISS C = BLACK '1987 (Total $63.5 billion).';
TITLE4 H = 1 F = XSWISS C = BLACK 'HUD, CDBG, and Tax Transfers Only.';
TITLE5 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = 1.5 F = XSWISS J = L
  ' SOURCE: Congressional Budget Office (1988).';
FOOTNOTE2 H = 1 F = XSWISS J = L
  ' Sec. 8 Existing Housing = 4144 thous, 6.5%';
FOOTNOTE3 H = 1 F = XSWISS J = L
  ' Sec. 8 new construction = 3981 thous, 6.3%';
FOOTNOTE4 H = 1 F = XSWISS J = L
  ' Sec. 515 Rural Rent Sub = 853 thous, 1.3%';
FOOTNOTE5 H = 1 F = XSWISS J = L
  ' Sec. 502 Rural Loans = 1900 thous, 3%';
FOOTNOTE6 H = 1 F = XSWISS J = L
  ' Public Housing = 3517 thous, 5.5%';
FOOTNOTE7 H = 1 F = XSWISS J = L
  ' Other HUD-expired progs = 686 thous, 1%';
FOOTNOTE8 H = 1 F = XSWISS J = L
  ' Sec. 235 Mtg Int Subs = 182 thous, .2%';
FOOTNOTE9 H = 1 F = XSWISS J = L
  ' CDBG funded rehab = 1300 thous, 2%';
FOOTNOTE10 H = 1 F = XSWISS J = L ' ';
DATA TEMP;
INPUT PROGRAM $ 1-16 AMOUNT 40-45;
CARDS;
Public, Othr                8438
Hmwner Tax Prefs           47000
Sec 8 New, Exist           8125
;
PROC GCHART;
PIE PROGRAM / FREQ = AMOUNT
  NAME = 'INSIDE'
  SLICE = INSIDE
  VALUE = INSIDE
  PERCENT = INSIDE
  EXPLODE = 'Hmwner Tax Prefs'
  NOHEADING;

```

## Appendix B (continued)

```
/*SOURCE FILE SBSTR1 SAS. REFID = SBSTR1.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,4);
%LABEL(1970,100000,'PUBLIC HOUSING STARTS',BLACK,0,0,.75,XSWISS,9);
%LABEL(1970,2375000,'TOTAL HOUSING STARTS',BLACK,0,0,.75,XSWISS,9);
RUN;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 1.8 F = XSWISS C = RED 'ANNUAL HOUSING STARTS IN THE UNITED
STATES';
TITLE3 H = 1 F = XSWISS C = BLACK '1889-1988, Total and Public';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS J = L ' the U.S. 1990, No. 1260.,'
'and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G11.SAS;
RUN;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 C = BLACK V = DIAMOND I = JOIN;
SYMBOL2 C = BLACK V = PLUS I = JOIN L = 2;
PLOT T * YR = 1
      SUBS * YR = 2 / OVERLAY
          VAXIS = 0 TO 2500000 BY 250000
          HAXIS = 1885 TO 1995 BY 10;
```

## Appendix B (continued)

```
/*SOURCE FILE FDLIPI SAS. REFID = FDLIPI*/
%X8790;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 1.8 F = XSWISS C = RED 'FEDERAL CONTINGENT LIABILITIES FOR HOUSING';
TITLE3 H = 1 F = XSWISS C = BLACK '1987 (Total $967 billion).';
TITLE4 H = .75 F = XSWISS C = BLACK 'Pie figures in millions.';
TITLE5 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK
'SOURCE: Congressional Budget Office (1988).';
DATA TEMP;
INPUT PROGRAM $ 1-16 AMOUNT 40-45;
CARDS;
FHA mrtg ins                270
VA mrtg ins                  65
GNMA securities              309
FNMA prin bals               97
FHLMC prin bals              226
;
PROC GCHART;
PATTERN1 V = L1;
PATTERN2 V = R1;
PATTERN3 V = S;
PATTERN4 V = L2;
PATTERN5 V = R2;
PIE PROGRAM / FREQ = AMOUNT
    NAME = 'ARROW'
    SLICE = ARROW
    VALUE = ARROW
    PERCENT = ARROW
    NOHEADING;
```

## Appendix B (continued)

```

/*SOURCE FILE SEAT1 SAS. REFID = SEAT1.*/
/*%PS (FILENAME = SEAT1 LISTPS A);*/
%x8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%SYSTEM(5,5,5);
%LABEL(17,1,'DIAMOND = MULTI-UNIT STARTS',BLACK,0,0,1.2,XSWISS,6);
%LABEL(60,1,'PLUS = UNEMPLOYMENT RATE',BLACK,0,0,1.2,XSWISS,6);
%LABEL(78,1,'SQUARE = LT INTEREST RATE',BLACK,0,0,1.2,XSWISS,6);
RUN;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 1.8 F = XSWISS C = RED
""SEAT OF THE PANTS BUILDER," APARTMENT 'STARTS';
TITLE3 H = 1 F = XSWISS '1970-1983';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS J = L ' SOURCE: U.S. Dept. of Commerce, '
'Statistical Abstract of the U.S. 1990,'
'No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G2.SAS;
IF YR < 1970 THEN DELETE;
RUN;
PROC GPLOT ANNOTATE = LABELS;
    LABEL UNEM = 'ANNUAL UNEMPLOYMENT & LONG-TERM INTEREST RATES';
SYMBOL1 V = DIAMOND I = JOIN C = BLACK;
SYMBOL2 V = PLUS I = JOIN L = 2 C = BLACK;
SYMBOL3 V = SQUARE I = JOIN L = 4 C = BLACK;
PLOT APTSTRT * YR = 1 /
    HAXIS = 1970 TO 1984 BY 2
    HMINOR = 1;
PLOT2 UNEM * YR = 2
    LTINT * YR = 3 / OVERLAY;

```

## Appendix B (continued)

```
/*SOURCE FILE SEAT2 SAS. REFID = SEAT2.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%SYSTEM(5,5,5);
%LABEL(17,1,'DIAMOND = SINGLE STARTS',BLACK,0,0,1.2,XSWISS,6);
%LABEL(60,1,'PLUS = UNEMPLOYMENT RATE',BLACK,0,0,1.2,XSWISS,6);
%LABEL(78,1,'SQUARE = LT INTEREST RATE',BLACK,0,0,1.2,XSWISS,6);
RUN;
TITLE1 H=1 F=XSWISS ' ';
TITLE2 H=1.8 F=XSWISS C=RED "'SEAT OF THE PANTS" BUILDER, SINGLE STARTS';
TITLE3 H=1 F=XSWISS '1970-1983';
TITLE4 H=2 F=XSWISS ' ';
FOOTNOTE1 H=.75 F=XSWISS J=L ' SOURCE: U.S. Dept. of Commerce, '
'Statistical Abstract of the U.S. 1990,'
'No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G2.SAS;
IF YR < 1970 THEN DELETE;
RUN;
PROC GPLOT ANNOTATE=LABELS;
  LABEL LTINT='ANNUAL UNEMPLOYMENT & LONG-TERM INTEREST RATES';
  SYMBOL1 V=DIAMOND I=JOIN C=BLACK;
  SYMBOL2 V=PLUS I=JOIN L=2 C=BLACK;
  SYMBOL3 V=SQUARE I=JOIN L=4 C=BLACK;
  PLOT SINGSTR *YR = 1 /
    HAXIS = 1970 TO 1984 BY 2
    HMINOR = 1;
  PLOT2 LTINT *YR = 2
    UNEM *YR = 3 / OVERLAY;
```

## Appendix B (continued)

```
/*SOURCE FILE CERTCIRC SAS. REFID = CERT1*/
/*%PS (FILENAME = OUTPUT LISTPS A)*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7;
DATA LABELS;
LENGTH TEXT $ 40;
%DCLANNO;
%SYSTEM(5,5,5);
%CIRCLE(25,28.75,25,BLACK);
%CIRCLE(25,53.75,25,BLACK);
%CIRCLE(53.33,41.25,25,BLACK);
%LABEL(25,28.75,'PERCEPTUAL',BLACK,0,0,3,XSWISS,7);
%LABEL(3.33,58.75,'DEMONSTRATIVE',BLACK,0,0,3,XSWISS,3);
%LABEL(53.33,47.5,'MORAL',BLACK,0,0,3,XSWISS,9);
%LABEL(41.64,36.25,' < = PLANNING',BLACK,302,0,2,XSWISS,9);
%LABEL(6.33,43.25,'POLICY ANALYSIS = >',BLACK,0,0,2,XSWISS,9);
%LABEL(31.65,43.25,'GOAL',BLACK,0,0,2,XSWISS,9);
%LABEL(34.97,48.75,' < = PROPAGANDA',BLACK,58,0,2,XSWISS,9);
%LABEL(0,95,'SEEKING THE THREE CERTAINTIES',RED,0,0,4,XSWISS,9);
%LABEL(0,90,'With Euler Certainty Types',RED,0,0,2,XSWISS,9);
%LABEL(0,87,'and Overlapping Certainties',RED,0,0,2,XSWISS,9);
%LABEL(0,5,'See Euler, 1761.',BLACK,0,0,2,XSWISS,9);
RUN;
PROC GANNO ANNOTATE = LABELS;
RUN;
```

## Appendix B (continued)

```
/*SOURCE FILE CERTCIRC SAS. REFID = CERT1*/
/*%PS (FILENAME = OUTPUT LISTPS A)*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7;
DATA LABELS;
LENGTH TEXT $ 40;
%DCLANNO;
%SYSTEM(5,5,5);
%CIRCLE(25,28.75,25,BLACK);
%CIRCLE(25,53.75,25,BLACK);
%CIRCLE(53.33,41.25,25,BLACK);
%LABEL(25,28.75,'PERCEPTUAL',BLACK,0,0,3,XSWISS,7);
%LABEL(3.33,58.75,'DEMONSTRATIVE',BLACK,0,0,3,XSWISS,3);
%LABEL(53.33,47.5,'MORAL',BLACK,0,0,3,XSWISS,9);
%LABEL(8.33,31.25,'koinh aisqhsis',BLACK,0,0,2,GREEK,9);
%LABEL(11.66,21.25,'untutored perception',BLACK,0,0,2,XSWISS,9);
%LABEL(33.32,33.75,'SENSUS COMMUNIS',BLACK,0,0,1.15,ITALIC,9);
%LABEL(11.66,41.25,'PEIRCE',BLACK,0,0,2,XSWISS,9);
%LABEL(29.98,41.25,'Sagacity',BLACK,0,0,2,XSWISS,9);
%LABEL(38.31,29,'Scottish',BLACK,0,0,2,XSWISS,9);
%LABEL(0,95,'DEFINITIONS OF COMMON SENSE',RED,0,0,4,XSWISS,9);
%LABEL(0,90,'With Euler Certainty Types',RED,0,0,2,XSWISS,9);
%LABEL(0,87,'and Overlapping Certainties',RED,0,0,2,XSWISS,9);
%LABEL(0,5,'See Euler, 1761; OED, 1989.',BLACK,0,0,2,XSWISS,9);
RUN;
PROC GANNO ANNOTATE = LABELS;
RUN;
```

## Appendix B (continued)

```
/*SOURCE FILE CERTCIRC SAS. REFID = CERT1*/
/*%PS (FILENAME = OUTPUT LISTPS A)*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7;
DATA LABELS;
LENGTH TEXT $ 40;
%DCLANNO;
%SYSTEM(5,5,5);
%CIRCLE(25,28.75,25,BLACK);
%CIRCLE(25,53.75,25,BLACK);
%CIRCLE(53.33,41.25,25,BLACK);
%LABEL(25,28.75,'PERCEPTUAL',BLACK,0,0,3,XSWISS,7);
%LABEL(3.33,58.75,'DEMONSTRATIVE',BLACK,0,0,3,XSWISS,3);
%LABEL(53.33,47.5,'MORAL',BLACK,0,0,3,XSWISS,9);
%LABEL(41.64,36.25,'< = PLANNING',BLACK,302,0,2,XSWISS,9);
%LABEL(6.33,43.25,'POLICY ANALYSIS = >',BLACK,0,0,2,XSWISS,9);
%LABEL(31.65,43.25,'GOAL',BLACK,0,0,2,XSWISS,9);
%LABEL(34.97,48.75,'< = PROPAGANDA',BLACK,58,0,2,XSWISS,9);
%LABEL(0,95,'SEEKING THE THREE CERTAINTIES',RED,0,0,4,XSWISS,9);
%LABEL(0,90,'With Euler Certainty Types',RED,0,0,2,XSWISS,9);
%LABEL(0,87,'and Overlapping Certainties',RED,0,0,2,XSWISS,9);
%LABEL(0,5,'See Euler, 1761.',BLACK,0,0,2,XSWISS,9);
RUN;
PROC GANNO ANNOTATE = LABELS;
RUN;
```



## Appendix B (continued)

```
/*SOURCE FILE ANNSTR1 SAS. REFID=PREWWIS.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ' ;
TITLE2 H = 2 F = XSWISS C = RED 'ANNUAL HOUSING STARTS IN THE UNITED STATES';
TITLE3 H = 1 F = XSWISS C = BLACK '1889-1920';
TITLE4 H = 2 F = XSWISS ' ' ;
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR > 1920 THEN DELETE;
RUN;
PROC GPLOT;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT T * YR / VAXIS = 0 TO 600000 BY 100000
      HAXIS = 1885 TO 1920 BY 5
      HMINOR = 4;
```

## Appendix B (continued)

```
/*SOURCE FILE ANNSTRT2 SAS. REFID = ROARS.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'ANNUAL HOUSING STARTS IN THE UNITED STATES';
TITLE3 H = 1 F = XSWISS C = BLACK '1915-1935';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1915 THEN DELETE;
IF YR > 1935 THEN DELETE;
RUN;
PROC GPLOT;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT T * YR / VAXIS = 0 TO 1000000 BY 100000
      HAXIS = 1915 TO 1935 BY 5
      HMINOR = 4;
```

## Appendix B (continued)

```
/*SOURCE FILE ANNSTRT3 SAS. REFID = DEALS.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H=1 F=XSWISS ' ';
TITLE2 H=2 F=XSWISS C=RED 'ANNUAL HOUSING STARTS IN THE UNITED STATES';
TITLE3 H=1 F=XSWISS C=BLACK '1930-1950';
TITLE4 H=2 F=XSWISS ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1930 THEN DELETE;
IF YR > 1950 THEN DELETE;
RUN;
PROC GPLOT;
SYMBOL1 V=DIAMOND I=JOIN;
PLOT T * YR / VAXIS = 0 TO 2000000 BY 200000
      HAXIS = 1930 TO 1950 BY 5
      HMINOR = 4;
```

## Appendix B (continued)

```
/*SOURCE FILE MAPEXIST SAS. REFID = MAPEXST.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ' ;
TITLE2 H = 1.8 F = XSWISS C = RED 'EXISTING HOME SALES BY STATE, 1988';
TITLE3 H = 1 F = XSWISS C = BLACK '(TOTAL 3.951 MILLION).';
TITLE4 H = 2 F = XSWISS ' ' ;
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: U.S. Department of Commerce,';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK
'Statistical Abstract of the U.S., 1990.';
PROC GMAP DATA = SITES.SAS
MAP = MAPS.US;
ID STATE;
LABEL EXIST88 = 'EXISTING HOMES SOLD';
SURFACE EXIST88 / CBODY = MAROON
TILT = 45
NLINES = 100;
```

## Appendix B (continued)

```
/*SOURCE FILE MAPNEW SAS. REFID = MAPNEW.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 1.8 F = XSWISS C = RED
      'NEW PRIVATELY OWNED HOUSING UNITS AUTHORIZED';
TITLE3 H = 1 F = XSWISS C = BLACK '1987 (Total 1.54 million).';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: U.S. Department of Commerce,';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK
      'Statistical Abstract of the U.S., 1990.';
PROC GMAP DATA = SITES.SAS
      MAP = MAPS.US;
ID STATE;
LABEL CONST = 'UNITS AUTHORIZED';
SURFACE CONST / CBODY = MAROON
      TILT = 45
      NLINES = 100;
```

## Appendix B (continued)

```
/*SOURCE FILE MAPLIHA SAS. REFID = MAPLIHA.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ' ;
TITLE2 H = 1.8 F = XSWISS C = RED 'HUD LOW INCOME HOUSING ASSISTANCE BY
STATE';
TITLE3 H = 1 F = XSWISS C = BLACK '1988 (Total 6.541 Billion $.)';
TITLE4 H = 2 F = XSWISS ' ' ;
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: U.S. Department of Commerce,';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK
'Statistical Abstract of the U.S., 1990.';
PROC GMAP DATA = SITES.SAS
MAP = MAPS.US;
ID STATE;
LABEL LIHA = 'HUD LOW INCOME HOUSING ASSISTANCE';
SURFACE LIHA / CBODY = MAROON
TILT = 45
NLINES = 100;
```

## Appendix B (continued)

```
/*SOURCE FILE MAPCOMD SAS. REFID = MAPCOMD.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ' ;
TITLE2 H = 1.8 F = XSWISS C = RED 'HUD COMMUNITY DEVELOPMENT FUNDING BY
STATE';
TITLE3 H = 1 F = XSWISS C = BLACK '1988 (Total 3.050 Billion $.)';
TITLE4 H = 2 F = XSWISS ' ' ;
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: U.S. Department of Commerce,';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK
'Statistical Abstract of the U.S., 1990.';
PROC GMAP DATA = SITES.SAS
MAP = MAPS.US;
ID STATE;
LABEL COMD = 'HUD COMMUNITY DEVELOPMENT FUNDING';
SURFACE COMD / CBODY = MAROON
TILT = 45
NLINES = 100;
```

## Appendix B (continued)

```
/*SOURCE FILE ANNSTR4 SAS. REFID = BOOMS.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'ANNUAL HOUSING STARTS IN THE UNITED STATES';
TITLE3 H = 1 F = XSWISS C = BLACK '1945-1969';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1945 THEN DELETE;
IF YR > 1969 THEN DELETE;
RUN;
PROC GPLOT;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT T * YR / VAXIS = 1000000 TO 2000000 BY 100000
      HAXIS = 1945 TO 1970 BY 5
      HMINOR = 4;
```



## Appendix B (continued)

```
/*SOURCE FILE ANNSTRT5 SAS. REFID=ROLLS.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE=6 VSIZE=7.5;
TITLE1 H=1 F=XSWISS ' ';
TITLE2 H=2 F=XSWISS C=RED 'ANNUAL HOUSING STARTS IN THE UNITED STATES';
TITLE3 H=1 F=XSWISS C=BLACK '1970-1987';
TITLE4 H=2 F=XSWISS ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1970 THEN DELETE;
IF YR > 1988 THEN DELETE;
RUN;
PROC GPLOT;
SYMBOL1 V=DIAMOND I=JOIN;
PLOT T * YR / VAXIS = 1000000 TO 2500000 BY 100000
      HAXIS = 1970 TO 1990 BY 5
      HMINOR=4;
```

## Appendix B (continued)

```

/*SOURCE FILE CHAO1GRF SAS. REFID = CHAALL.*
%x8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6IN VSIZE = 7.5IN;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(432000,328000,'1889',BLACK,0,0,2,XSWISS,5);
%LABEL(415000,507000,'1904',BLACK,0,0,2,XSWISS,5);
%LABEL(208000,315000,'1918',BLACK,0,0,2,XSWISS,5);
%LABEL(539000,716000,'1921',BLACK,0,0,2,XSWISS,5);
%LABEL(599000,330000,'1929',BLACK,0,0,2,XSWISS,5);
%LABEL(693000,706000,'1940',BLACK,0,0,2,XSWISS,5);
%LABEL(446000,191000,'1942',BLACK,0,0,2,XSWISS,5);
%LABEL(416000,1023000,'1945',BLACK,0,0,2,XSWISS,5);
%LABEL(1641000,1646000,'1954',BLACK,0,0,2,XSWISS,5);
%LABEL(1582000,1635000,'1962',BLACK,0,0,2,XSWISS,5);
%LABEL(1600000,1196000,'1965',BLACK,0,0,2,XSWISS,5);
%LABEL(1559000,2085000,'1970',BLACK,0,0,2,XSWISS,5);
%LABEL(2147000,1353000,'1973',BLACK,0,0,2,XSWISS,5);
%LABEL(1162000,1712000,'1982',BLACK,0,0,2,XSWISS,5);
%LABEL(1897000,1623000,'1986',BLACK,0,0,2,XSWISS,5);
RUN;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'GRAPHIC TEST FOR CHAOS: ';
TITLE3 H = 1 F = XSWISS C = BLACK 'HOUSING STARTS 1889-1988';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT TPLUS1 * T / VAXIS = 0 TO 2500000 BY 500000
HAXIS = 0 TO 2500000 BY 500000;

```

## Appendix B (continued)

```
/*SOURCE FILE ANNSTR6 SAS. REFID = STRALL.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H=1 F=XSWISS ' ';
TITLE2 H=2 F=XSWISS C=RED 'ANNUAL HOUSING STARTS IN THE UNITED STATES';
TITLE3 H=1 F=XSWISS C=BLACK '1889-1988, Public and Private';
TITLE4 H=2 F=XSWISS ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
RUN;
PROC GPLOT;
SYMBOL1 V=DIAMOND I=JOIN;
PLOT T * YR / VAXIS = 0 TO 2500000 BY 250000
      HAXIS = 1885 TO 1995 BY 10;
```

## Appendix B (continued)

```

/*SOURCE FILE CHAO2GRF SAS. REFID = CHA84.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6IN VSIZE = 7.5IN;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(342000,328000,'1889',BLACK,0,0,1,XSWISS,9);
%LABEL(315000,507000,'1904',BLACK,0,0,1,XSWISS,9);
%LABEL(118000,315000,'1918',BLACK,0,0,1,XSWISS,9);
%LABEL(449000,716000,'1921',BLACK,0,0,1,XSWISS,9);
%LABEL(509000,330000,'1929',BLACK,0,0,1,XSWISS,9);
%LABEL(603000,706000,'1940',BLACK,0,0,1,XSWISS,9);
%LABEL(356000,191000,'1942',BLACK,0,0,1,XSWISS,9);
%LABEL(326000,1023000,'1945',BLACK,0,0,1,XSWISS,9);
RUN;
TITLE1 H = 1 F = XSWISS ' ' ;
TITLE2 H = 2 F = XSWISS C = RED 'GRAPHIC TEST FOR CHAOS:.';
TITLE3 H = 1 F = XSWISS C = BLACK 'HOUSING STARTS 1889-1945';
TITLE4 H = 2 F = XSWISS ' ' ;
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR > 1945 THEN DELETE;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT TPLUS1 * T / VAXIS = 0 TO 2500000 BY 500000
HAXIS = 0 TO 2500000 BY 500000;

```

## Appendix B (continued)

```
/*SOURCE FILE CHAO25RF SAS. REFID = CHA15.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,4);
%LABEL(342000,328000,'1889',BLACK,0,0,.75,XSWISS,9);
%LABEL(381000,267000,'1892',BLACK,0,0,.75,XSWISS,9);
%LABEL(309000,257000,'1895',BLACK,0,0,.75,XSWISS,9);
%LABEL(282000,189000,'1899',BLACK,0,0,.75,XSWISS,9);
%LABEL(189000,275000,'1900',BLACK,0,0,.75,XSWISS,9);
%LABEL(315000,507000,'1904',BLACK,0,0,.75,XSWISS,9);
%LABEL(507000,487000,'1905',BLACK,0,0,.75,XSWISS,9);
%LABEL(432000,416000,'1907',BLACK,0,0,.75,XSWISS,9);
%LABEL(492000,387000,'1909',BLACK,0,0,.75,XSWISS,9);
%LABEL(433000,437000,'1915',BLACK,0,0,.75,XSWISS,9);
RUN;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'GRAPHIC TEST FOR CHAOS:.';
TITLE3 H = 1 F = XSWISS C = BLACK 'HOUSING STARTS 1889-1915.';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR > 1915 THEN DELETE;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT TPLUS1 * T / VAXIS = 0 TO 600000 BY 100000
HAXIS = 0 TO 600000 BY 100000;
```

## Appendix B (continued)

```
/*SOURCE FILE CHAO27RF SAS. REFID = CHA45.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,4);
%LABEL(118000,315000,'1918',BLACK,0,0,.75,XSWISS,9);
%LABEL(449000,716000,'1921',BLACK,0,0,.75,XSWISS,9);
%LABEL(937000,849000,'1925',BLACK,0,0,.75,XSWISS,9);
%LABEL(753000,509000,'1928',BLACK,0,0,.75,XSWISS,9);
%LABEL(509000,330000,'1929',BLACK,0,0,.75,XSWISS,9);
%LABEL(134000,93000,'1932',BLACK,0,0,.75,XSWISS,9);
%LABEL(336000,406000,'1937',BLACK,0,0,.75,XSWISS,9);
%LABEL(603000,706000,'1940',BLACK,0,0,.75,XSWISS,9);
%LABEL(706000,356000,'1941',BLACK,0,0,.75,XSWISS,9);
%LABEL(346000,191000,'1942',BLACK,0,0,.75,XSWISS,9);
%LABEL(326000,1023000,'1945',BLACK,0,0,.75,XSWISS,9);
RUN;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'GRAPHIC TEST FOR CHAOS:';
TITLE3 H = 1 F = XSWISS C = BLACK 'HOUSING STARTS 1915-1945';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1915 THEN DELETE;
IF YR > 1945 THEN DELETE;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT TPLUS1 * T / VAXIS = 0 TO 1250000 BY 250000
HAXIS = 0 TO 1250000 BY 250000;
```

## Appendix B (continued)

```
/*SOURCE FILE CHAO3GRF SAS. REFID = CHA48.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6IN VSIZE = 7.5IN;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(326000,1023000,'1945',BLACK,0,0,2,XSWISS,9);
%LABEL(1551000,1646000,'1954',BLACK,0,0,2,XSWISS,9);
%LABEL(1492000,1635000,'1962',BLACK,0,0,2,XSWISS,9);
%LABEL(1510000,1196000,'1965',BLACK,0,0,2,XSWISS,9);
%LABEL(1469000,2085000,'1970',BLACK,0,0,2,XSWISS,9);
%LABEL(2057000,1353000,'1973',BLACK,0,0,2,XSWISS,9);
%LABEL(1072000,1712000,'1982',BLACK,0,0,2,XSWISS,9);
RUN;
TITLE1 H=1 F=XSWISS ' ';
TITLE2 H=2 F=XSWISS C=RED 'GRAPHIC TEST FOR CHAOS:.';
TITLE3 H=1 F=XSWISS C=BLACK 'HOUSING STARTS 1945-1985';
TITLE4 H=2 F=XSWISS ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1945 THEN DELETE;
IF YR > 1985 THEN DELETE;
PROC GPLOT ANNOTATE=LABELS;
SYMBOL1 V=DIAMOND I=JOIN;
PLOT TPLUS1 * T / VAXIS = 300000 TO 2500000 BY 500000
HAXIS = 300000 TO 2500000 BY 500000;
```

## Appendix B (continued)

```
/*SOURCE FILE CHAO4GRF SAS. REFID = CHA68.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(1510000,1196000,'1965',BLACK,0,0,2,XSWISS,9);
%LABEL(1469000,2085000,'1970',BLACK,0,0,2,XSWISS,9);
%LABEL(2057000,1353000,'1973',BLACK,0,0,2,XSWISS,9);
%LABEL(1072000,1712000,'1982',BLACK,0,0,2,XSWISS,9);
RUN;
TITLE1 H=1 F=XSWISS C=BLACK ' ';
TITLE2 H=2 F=XSWISS C=RED 'GRAPHIC TEST FOR CHAOS:.';
TITLE3 H=1 F=XSWISS C=BLACK 'HOUSING STARTS 1965-1985';
TITLE4 H=2 F=XSWISS C=BLACK ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1965 THEN DELETE;
IF YR > 1985 THEN DELETE;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V=DIAMOND I=JOIN;
PLOT TPLUS1 * T / VAXIS = 100000 TO 2500000 BY 500000
HAXIS = 100000 TO 2500000 BY 500000;
```



## Appendix B (continued)

```
/*SOURCE FILE CHAO5GRF SAS. REFID = CHA78.*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6IN VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(1548000,2002000,'1976',BLACK,0,0,2,XSWISS,9);
%LABEL(2036000,1760000,'1978',BLACK,0,0,2,XSWISS,9);
%LABEL(1072000,1712000,'1982',BLACK,0,0,2,XSWISS,9);
RUN;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'GRAPHIC TEST FOR CHAOS:';
TITLE3 H = 1 F = XSWISS C = BLACK 'HOUSING STARTS 1975-1985';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .75 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
IF YR < 1975 THEN DELETE;
IF YR > 1985 THEN DELETE;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT TPLUS1 * T / VAXIS = 100000 TO 2400000 BY 400000
HAXIS = 100000 TO 2400000 BY 400000;
```

## Appendix B (continued)

```
/*SOURCE FILE CONHGRF SAS. REFID = COHN.*/  
/*%PS (FILENAME = OUTPUT LISTPS A);*/  
%X8790C;  
X FILEDEF ANNO DISK SAMPGRP MACLIB *;  
%INCLUDE ANNO(ANNOCMS);  
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;  
TITLE1 H = 1 F = XSWISS ' ' ;  
TITLE2 H = 2 F = XSWISS C = RED 'CONSTRUCTION PUT IN PLACE: NEW HOUSING  
UNITS';  
TITLE3 H = 1 F = XSWISS C = BLACK '1964-1982, IN MILLIONS';  
TITLE4 H = 2 F = XSWISS ' ' ;  
FOOTNOTE1 H = .75 F = XSWISS 'SOURCE: NBER/CBANK DATASETS AT UIC';  
DATA TEMP;  
SET POTER2.SAS;  
PROC GPLOT;  
SYMBOL1 V = DIAMOND I = JOIN;  
PLOT CONH * DATE / VAXIS = 0 TO 100000 BY 10000;
```

## Appendix B (continued)

```

/*SOURCE FILE MULSING SAS. REFID = MULSIN*/
/*%PS (FILENAME = OUTPUT LISTPS A);*/
%x8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
%SYSTEM(2,2,4);
%LABEL(1945,75000,'NOT REPORTED',BLACK,58,0,.85,XSWISS,6);
%LABEL(1945,500000,'NOT REPORTED',BLACK,82,0,.85,XSWISS,6);
%SYSTEM(5,5,5);
%LABEL(17,2,'DIAMOND = SINGLE',BLACK,0,0,1.5,XSWISS,6);
%LABEL(65,2,'PLUS = MULTI',BLACK,0,0,1.5,XSWISS,6);
RUN;
TITLE1 H = 1 F = XSWISS C = BLACK ' ';
TITLE2 H = 2 F = XSWISS C = RED 'MULTIPLE, SINGLE HOUSING STARTS COMPARED';
TITLE3 H = 1.5 F = XSWISS C = BLACK '1889-1988, Total and Public';
TITLE4 H = 2 F = XSWISS C = BLACK ' ';
FOOTNOTE1 H = .85 F = XSWISS C = BLACK J = L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H = .85 F = XSWISS C = BLACK J = L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
RUN;
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN C = BLACK;
SYMBOL2 V = PLUS I = JOIN L = 3 C = BLACK;
PLOT SINGL *YR = 1
MULTI *YR = 2 / OVERLAY
VAXIS = 0 TO 1500000 BY 250000
HAXIS = 1885 TO 1995 BY 10
HMINOR = 9;

```

## Appendix B (continued)

```
/*SOURCE FILE MULTICHA SAS. REFID=MULCHA*/
/*%PS (FILENAME= OUTPUT LISTPS A); IS POSTSCRIPT CODE*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6IN VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(108000,247000,'1904',BLACK,0,0,1.25,XSWISS,5);
%LABEL(27000,126000,'1918',BLACK,0,0,1.25,XSWISS,5);
%LABEL(133000,329000,'1921',BLACK,0,0,1.25,XSWISS,5);
%LABEL(193000,153000,'1929',BLACK,0,0,1.25,XSWISS,5);
%LABEL(117000,152000,'1940',BLACK,0,0,1.25,XSWISS,5);
%LABEL(63000,97000,'1942',BLACK,0,0,1.25,XSWISS,5);
%LABEL(496000,672000,'1962',BLACK,0,0,1.25,XSWISS,5);
%LABEL(545000,466000,'1965',BLACK,0,0,1.25,XSWISS,5);
%LABEL(656000,983500,'1970',BLACK,0,0,1.25,XSWISS,5);
%LABEL(925500,514500,'1973',BLACK,0,0,1.25,XSWISS,5);
%LABEL(409100,694500,'1982',BLACK,0,0,1.25,XSWISS,5);
%LABEL(628100,526700,'1986',BLACK,0,0,1.25,XSWISS,5);
RUN;
TITLE1 H=1.25 F=XSWISS C=BLACK ' ';
TITLE2 H=2 F=XSWISS C=RED 'GRAPHIC TEST FOR CHAOS:.';
TITLE3 H=1.25 F=XSWISS C=BLACK 'MULTI HOUSING STARTS 1889-1988';
TITLE4 H=1.25 F=XSWISS C=BLACK ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
MPLUS1=MULTI;
M=LAG(MULTI);
LABEL M='CURRENT YEAR MULTI HOUSING PRODUCTION';
LABEL MPLUS1='YEAR AHEAD MULTI HOUSING PRODUCTION';
PROC GPLOT ANNOTATE=LABELS;
SYMBOL1 V=DIAMOND I=JOIN;
PLOT MPLUS1 * M / VAXIS = 0 TO 1500000 BY 250000
HAXIS = 0 TO 1500000 BY 250000;
```

## Appendix B (continued)

```

/*SOURCE FILE SINGLCHA SAS. REFID = SINCHA*/
/*%PS (FILENAME = OUTPUT LISTPS A); IS POSTSCRIPT CODE*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6IN VSIZE = 7.5;
DATA LABELS;
%DCLANNO;
%SYSTEM(2,2,5);
%LABEL(207000,386000,'1904',BLACK,0,0,1.25,XSWISS,5);
%LABEL(91000,289000,'1918',BLACK,0,0,1.25,XSWISS,5);
%LABEL(316000,487000,'1921',BLACK,0,0,1.25,XSWISS,5);
%LABEL(316000,257000,'1929',BLACK,0,0,1.25,XSWISS,5);
%LABEL(486000,654000,'1940',BLACK,0,0,1.25,XSWISS,5);
%LABEL(293000,194000,'1942',BLACK,0,0,1.25,XSWISS,5);
%LABEL(996000,1063000,'1962',BLACK,0,0,1.25,XSWISS,5);
%LABEL(965000,830000,'1965',BLACK,0,0,1.25,XSWISS,5);
%LABEL(813000,1201000,'1970',BLACK,0,0,1.25,XSWISS,5);
%LABEL(1132000,938000,'1973',BLACK,0,0,1.25,XSWISS,5);
%LABEL(663000,1118000,'1982',BLACK,0,0,1.25,XSWISS,5);
%LABEL(1179000,1196000,'1986',BLACK,0,0,1.25,XSWISS,5);
RUN;
TITLE1 H=1.25 F=XSWISS C=BLACK ' ';
TITLE2 H=2 F=XSWISS C=RED 'GRAPHIC TEST FOR CHAOS:';
TITLE3 H=1.25 F=XSWISS C=BLACK 'SINGLE HOUSING STARTS 1889-1988';
TITLE4 H=1.25 F=XSWISS C=BLACK ' ';
FOOTNOTE1 H=.75 F=XSWISS C=BLACK J=L ' SOURCE: U.S. Dept. of Commerce, '
'Historical Statistics of the U.S., Colonial Times to 1970,'
'Series N 156, and Statistical Abstract of';
FOOTNOTE2 H=.75 F=XSWISS C=BLACK J=L ' the U.S.'
'1990, No. 1260., and Economic Report of the President, 1990, C-53.';
DATA TEMP;
SET G10.SAS;
SPLUS1 = SINGL;
S = LAG(SINGL);
LABEL S = 'CURRENT YEAR SINGLE HOUSING PRODUCTION';
LABEL SPLUS1 = 'YEAR AHEAD SINGLE HOUSING PRODUCTION';
PROC GPLOT ANNOTATE = LABELS;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT SPLUS1 * S / VAXIS = 0 TO 1500000 BY 250000
HAXIS = 0 TO 1500000 BY 250000;

```

## Appendix B (continued)

```
/*SOURCE FILE GDCSHGRF SAS. REFID = GDCSH*/  
%X8790C;  
X FILEDEF ANNO DISK SAMPGRP MACLIB *;  
%INCLUDE ANNO(ANNOCMS);  
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;  
TITLE1 H=1 F=XSWISS ' ' ;  
TITLE2 H=2 F=XSWISS C=RED 'IMPLICIT PRICE DEFLATOR, PCE: HOUSING';  
TITLE3 H=1 F=XSWISS C=BLACK '1964-1982';  
TITLE4 H=2 F=XSWISS ' ' ;  
FOOTNOTE1 H=.75 F=XSWISS C=BLACK 'SOURCE: NBER/CBANK DATASETS AT UIC';  
DATA TEMP;  
SET POTER2.SAS;  
PROC GPLOT;  
SYMBOL1 V=DIAMOND I=JOIN;  
PLOT GDCSH * DATE / VAXIS = 0 TO 300 BY 25;
```

## Appendix B (continued)

```
/*SOURCE FILE GNPGRF SAS. REFID = GNPGRF*/  
%X8790C;  
X FILEDEF ANNO DISK SAMPGRP MACLIB *;  
%INCLUDE ANNO(ANNOCMS);  
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;  
TITLE1 H = 1 F = XSWISS ' ' ;  
TITLE2 H = 2 F = XSWISS C = RED 'GROSS NATIONAL PRODUCT';  
TITLE3 H = 1 F = XSWISS C = BLACK '1964-1982, IN MILLIONS';  
TITLE4 H = 2 F = XSWISS ' ' ;  
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: NBER/CBANK DATASETS AT UIC';  
DATA TEMP;  
SET POTER2.SAS;  
PROC GPLOT;  
SYMBOL1 V = DIAMOND I = JOIN;  
PLOT GNP * DATE / VAXIS = 0 TO 3500 BY 500;
```

## Appendix B (continued)

```
/*SOURCE FILE HNPIGRF SAS. REFID = HNPI*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
TITLE1 H = 1 F = XSWISS ' ';
TITLE2 H = 2 F = XSWISS C = RED 'NEW 1-FAMILY HOUSES SOLD, 1972 PRICE INDEX';
TITLE3 H = 1 F = XSWISS C = BLACK '1964-1982';
TITLE4 H = 2 F = XSWISS ' ';
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: NBER/CBANK DATASETS AT UIC';
DATA TEMP;
SET POTER2.SAS;
PROC GPLOT;
SYMBOL1 V = DIAMOND I = JOIN;
PLOT HNPI * DATE / VAXIS = 0 TO 300 BY 50;
```



## Appendix B (continued)

```
/*SOURCE FILE HNMMGRF SAS. REFID = HNMM*/  
%X8790C;  
X FILEDEF ANNO DISK SAMPGRP MACLIB *;  
%INCLUDE ANNO(ANNOCMS);  
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;  
TITLE1 H = 1 F = XSWISS ' ' ;  
TITLE2 H = 2 F = XSWISS C = RED 'MEDIAN NO. OF MONTHS, START TO SALE';  
TITLE3 H = 1 F = XSWISS C = BLACK '1964-1982, NEW 1-FAMILY HOUSES';  
TITLE4 H = 2 F = XSWISS ' ' ;  
FOOTNOTE1 H = .75 F = XSWISS C = BLACK 'SOURCE: NBER/CBANK DATASETS AT UIC';  
DATA TEMP;  
SET POTER2.SAS;  
PROC GPLOT;  
SYMBOL1 V = DIAMOND I = JOIN;  
PLOT HNMM * DATE / VAXIS = 0 TO 8 BY 1;
```

## Appendix B (continued)

```
/*SOURCE FILE FMDSLGRF SAS. REFID = ??.*  
%X8790C;  
X FILEDEF ANNO DISK SAMPGRP MACLIB *;  
%INCLUDE ANNO(ANNOCMS);  
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;  
TITLE1 H=1 F=XSWISS ' ' ;  
TITLE2 H=2 F=XSWISS C=RED 'NET INFLOW OF SAVINGS: ALL OPER. S & L';  
TITLE3 H=1 F=XSWISS C=BLACK '1964-1982, IN MILLIONS';  
TITLE4 H=2 F=XSWISS ' ' ;  
FOOTNOTE1 H=.75 F=XSWISS C=BLACK 'SOURCE: NBER/CBANK DATASETS AT UIC';  
DATA TEMP;  
SET POTER2.SAS;  
PROC GPLOT;  
SYMBOL1 V=DIAMOND I=JOIN;  
PLOT FMDSL I * DATE / VAXIS = -1000 TO 10000 BY 1000;
```

## Appendix B (continued)

```

/*SOURCE FILE SADPOIN SAS REFID = SADPOIN*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7.5;
DATA LABELS;
LENGTH TEXT $ 40;
%DCLANNO;
%SYSTEM(2,2,4);
%LABEL(0,12.5,'Qstar',BLACK,0,0,1.5,XSWISS,6);
%LABEL(0,16.4,'Qhat',BLACK,0,0,1.5,XSWISS,6);
%LABEL(0,23,'Qbar',BLACK,0,0,1.5,XSWISS,6);
%LABEL(9.5,25.5,',',BLACK,0,0,6,XSWISS,5);
%LABEL(0,28,'Q',BLACK,0,0,1.5,XSWISS,6);
%LABEL(9.5,10,'A',BLACK,0,0,1.5,XSWISS,5);
%LABEL(9.5,1,'Hstar',BLACK,0,0,1.5,XSWISS,5);
%LABEL(16,20,'Bprime',BLACK,0,0,1.5,XSWISS,5);
%LABEL(21,25.96,'Hdot = 0',BLACK,0,0,1.5,XSWISS,5);
%LABEL(14,5.7,'Qprime = 0',BLACK,0,0,1.5,XSWISS,6);
%LABEL(22,7.72,'Qprime = 0',BLACK,0,0,1.5,XSWISS,6);
%LABEL(9.5,15,'h',BLACK,0,0,5,MATH,5);
%LABEL(17,9,'g',BLACK,0,0,5,MATH,5);
%LABEL(10,17.5,'F',BLACK,0,0,2,MATH,5);
%LABEL(12,16.9,'F',BLACK,0,0,2,MATH,5);
%LABEL(21,17.8,'E',BLACK,0,0,2,MATH,5);
%LABEL(19,17,'E',BLACK,0,0,2,MATH,5);
RUN;
TITLE1 H = 1 F = XSWISS ' ' ;
TITLE2 H = 1.8 F = XSWISS C = RED 'POTERBA RATIONAL EXPECTATIONS';
TITLE3 H = 1.8 F = XSWISS C = RED 'HOUSING EQUILIBRIUM';
TITLE4 H = 2 F = XSWISS ' ' ;
FOOTNOTE1 H = 1.5 F = XSWISS J = C '(Poterba, 1984)';
DATA TEMP;
input x h a b sad;
cards;
0 . . . .
1 10.00317 24.73994 . .
2 10.02208 22.92624 . .
3 10.0687 21.24993 . .
4 10.15374 19.65704 . .
5 10.28717 18.12344 . .
6 10.47847 16.6355 . 18.83
7 10.73672 15.18447 27.18447 18.32
8 11.07073 13.76431 25.76431 17.87
9 11.48905 12.37061 24.37061 17.48
10 12 11 23 17.15

```

## Appendix B (continued)

11	12.61174	9.649829	21.64983	16.88
12	13.33225	8.317971	20.31797	16.67
13	14.16938	7.002678	19.00268	16.52
14	15.13084	5.702491	17.70249	16.43
15	16.22423	.	16.41617	16.4
16	17.45703	.	15.14266	16.43
17	18.83664	.	13.88105	16.52
18	20.37034	.	12.63052	16.67
19	22.06535	.	11.39037	16.88
20	23.92881	.	10.15999	17.15
21	25.96776	.	8.938795	17.48
22	.	.	7.7263	17.87
23	.	.	.	18.32
24	.	.	.	18.83

;

RUN;

PROC GPLOT ANNOTATE = LABELS;

SYMBOL1 C = BLACK I = JOIN;

SYMBOL2 C = BLACK I = JOIN;

SYMBOL3 C = BLACK I = JOIN;

SYMBOL4 C = BLACK I = JOIN;

PLOT h \* x = 1

a \* x = 2

b \* x = 3

sad \* x = 4 / OVERLAY

VAXIS = 0 TO 35 BY 35

HAXIS = 0 TO 30 BY 30;

## Appendix B (continued)

```
/*SOURCE FILE JMAC1 SAS. REFID = JMAC1*/
/*%PS (FILENAME = OUTPUT LISTPS A);*/
%X8790C;
X FILEDEF ANNO DISK SAMPGRP MACLIB *;
%INCLUDE ANNO(ANNOCMS);
GOPTIONS NOCHARACTERS NOSYMBOL NOTEXT82 BORDER HSIZE = 6 VSIZE = 7;
DATA LABELS;
LENGTH TEXT $ 60;
%DCLANNO;
%SYSTEM(5,5,5);
%LINE(15,5,85,5,BLACK,1,.25);
%LINE(15,5,15,75,BLACK,1,.25);
%LINE(15,53,55,9,BLACK,1,.5);
%LINE(15,37,33,15,BLACK,1,.5);
%LINE(15,31,29,12.8,BLACK,4,.5);
%LINE(15,29,51,29,BLACK,1,.5);
%LINE(15,27,47,27,BLACK,1,.5);
%LINE(15,23,51,23,BLACK,1,.5);
%LINE(47,27,47,5,BLACK,1,.5);
%LINE(51,29,51,5,BLACK,1,.5);
%LINE(31,35,63,19,BLACK,1,.5);
%LINE(47,27,57,17,BLACK,1,.5);
%LINE(35,21,63,35,BLACK,1,.5);
%LINE(35,15,63,29,BLACK,4,.5);
%LABEL(55,9,'Do',BLACK,0,0,3,XSWISS,3);
%LABEL(33,15,'Dr',BLACK,0,0,3,XSWISS,3);
%LABEL(12,29.5,'Pprime r',BLACK,0,0,3,XSWISS,4);
%LABEL(12,27,'P',BLACK,0,0,3,XSWISS,4);
%LABEL(13,23,'Pprime o',BLACK,0,0,3,XSWISS,4);
%LABEL(47,4,'Q',BLACK,0,0,3,XSWISS,4);
%LABEL(51,4,'Qprime',BLACK,0,0,3,XSWISS,6);
%LABEL(63,19,'Dt',BLACK,0,0,3,XSWISS,3);
%LABEL(57,18,'Dprime o',BLACK,0,0,3,XSWISS,9);
%LABEL(63,35,'S',BLACK,0,0,3,XSWISS,3);
%LABEL(63,29,'Sprime',BLACK,0,0,3,XSWISS,3);
%LABEL(25,95,'A SUBSIDY TO HOMEOWNERS',RED,0,0,4,XSWISS,9);
%LABEL(15,3,'(McDonald, 1979), Copyright 1979, Academic Press',
BLACK,0,0,1.5,XSWISS,9);
%LABEL(5,45,'PRICE OF HOUSING',BLACK,270,90,2,XSWISS,1);
%LABEL(64,4,'QUANTITY OF HOUSING',BLACK,0,0,2.3,XSWISS,9);
RUN;
PROC GANNO ANNOTATE = LABELS;
RUN;
```

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