

5/341

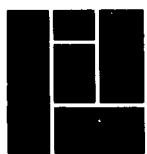
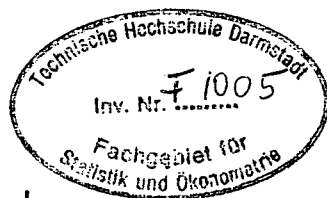
POLICY EXPLORATION THROUGH MICROANALYTIC SIMULATION

Guy Orcutt

Steven Caldwell

Richard Wertheimer II

Steven Franklin, Gary Hendricks,
Gerald Peabody, James Smith,
Sheila Zedlewski



The Urban Institute
Washington, D.C.

Table of Contents

Foreword iii

Acknowledgments xv

PART I AN INTRODUCTION TO MICROANALYTIC MODELS

Chapter 1 Microanalytic Simulation: An Overview 1

New Possibilities 1

Alternative Approaches to Modeling an Economy 3

The Need for Microanalytic Models 4

Some Previous Efforts 6

Outlines of a Microanalytic Model of an Economy Including Markets 7

Solution of Social System Models 9

Solution of The Urban Institute Microanalytic Model 12

Controlling Monte Carlo Variation 15

Modelling Paradigms and Data Bases 17

Public Use Samples as Aids in Estimating and Testing of Behavioral Relations 18

Time Series Development Possibilities Given Successive Public Use Samples 19

Generation of Predictions for Individuals and Small Groups 20

Chapter 2 DYNASIM—Simulating the Population and Its Income 25

The Microsimulation Process in Perspective 25

Program Sectors 27

The MICROPASS Program Sector 28

The MARRIAGE UNION Program Sector 34

The MACROMODEL Program Sector 35

PART II DEMOGRAPHIC OPERATING CHARACTERISTICS

Chapter 3 Death, Birth, and Immigration 43

DEATH—

Role in the Model 43

An Overview of the Mortality Model 44

Estimating the Age, Race, Sex, and Calendar Year Parameters 45

Marital Status 57

Education and Income 59

Parity 61

BIRTH 62

IMMIGRATION 65

Chapter 4 Family Formation 67

Theoretical Perspective 68

Model Specification 70

Over-Time Data from the 1960 and 1970 Censuses 70

Social Structural Effects: Data and Estimation Technique 81

Social Structural Effects: Results 86

Remarriage 90

Chapter 5 Family Dissolution 93**MODEL SPECIFICATION 93***Estimation Strategy 95**Stage One: Age, Period, and Cohort Effects 96**Stage Two: Social Structural Effects 113**Results 114**Conclusions 118***Chapter 6 Education 119***Overview of Model Structure 120**Grade School 121**High School 124**College 127**Graduate School 132***Chapter 7 Geographic Mobility 135***Role in the Model 135**Macro and Micro Approaches to Mobility 137**Specification of the Model 139**Estimation of Parameters 141***PART III ECONOMIC OPERATING
CHARACTERISTICS****Chapter 8 Labor: Participation, Wage Rates, and Unemployment 147****LABOR FORCE PARTICIPATION—***Role in the Model 147**Economic Theory and Labor Supply 148**Specification of the Labor Force Participation Function 150**Estimation of the Labor Force Participation Function 153**Results 153***HOURS IN THE LABOR FORCE—***Role in the Model 158**Theory and Specification of the Hours Equation 159**Estimation of the Hours Equation 161**Results 161***WAGE RATES AND EARNINGS—***Role in the Model 163**The Economic Theory of Wage Determination 164**Specification of the Model 165**Estimation of the Wage Rate Equations 167**Results 168***UNEMPLOYMENT—***Role in the Model 170**Theory of Unemployment 170**Specification of the Unemployment Equations 171***Chapter 9 Disability and Transfer Income 177****DISABILITY 178***Functional Form 179**Disability Status Equations 180***SOCIAL SECURITY 181***Eligibility or Coverage 182**Benefits 188***PENSIONS 190***Pension Receipt 191**Pension Income 192***UNEMPLOYMENT COMPENSATION 194***Coverage 195**Benefit Amount 197*

AID TO FAMILIES WITH DEPENDENT CHILDREN 198

- Coverage 199
- Economic Eligibility 202
- Benefit Calculation 204

SUPPLEMENTAL SECURITY INCOME 205

- Coverage 206
- Benefits 206

FOOD STAMPS 207

- Coverage 207
- Benefit 208

Chapter 10 Property Income, Taxes, Savings, Wealth, and Inheritance 211

WEALTH ACCUMULATION—

- General Statement of Procedures for Simulating Realized Capital Gains 212
- Asset Yield Income 213
- Income Tax 213
- Saving 214

THE INTERGENERATIONAL TRANSMISSION OF WEALTH 228

- Estimation of Inheritances from Outside Family Unit 241

PART IV EXPLORATIONS OF THE MODEL

Chapter 11 Monte Carlo Variability 247

- Approach to Measuring Monte Carlo Variance 249
- Experiments with a More Developed Model 250
- Method of Presentation of Experimental Results 250
- Estimates of the Monte Carlo Error for Samples of 1,000 Persons 251
- Monte Carlo Error for a Sample of 4,000 253
- Tests of Small Sample Bias 253
- Conclusions 258

Chapter 12 Marriage, Divorce, and Death Sensitivity Studies 259

- Alignment 259
- Comparing the 1970 Census to the 1970 Simulated Population 262
- Five Demographic Experiments 266
- Conclusions 269

Chapter 13 Exploration of Model Interactions 279

- Mortality Reduction 281
- Fertility Reduction 282
- Marriage Reduction 282
- Divorce Reduction 283
- Labor Force Reduction 284
- Unemployment Reduction 285

Chapter 14: Earnings of Women: Implications of Equality in the Labor Market 287

- Performing the Experiments 288
- Critical Assumptions and Limits of Study 289
- Results 290
- Experiment 1: Equal Pay for Equal Work 290
- Experiment 2: Equal Hours in the Labor Force 316
- Experiment 3: Equal Hours and Equal Pay 317
- A Comparison of Male and Female Earnings 318
- Conclusion 320

Chapter 15 Impact of Divorce on the Distribution of Income 321

RESULTS—

- Demographic Events 322
- Distribution of Income 323
- Major Income Components 327
- Conclusions 333

*Appendix A Two Glossaries and Functional Specifications 335**Glossary for Micro Variables 335**Glossary for Macro Variables 341**Detailed Functional Specifications 343**Appendix B Relation to Other Demographic Modeling Efforts 355**Appendix C Recalculating the Kitagawa-Hauser Differential Mortality
Ratios for Use in the Model 359**Bibliography 361*