

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Housing Markets and Racial Discrimination: A Microeconomic Analysis

Volume Author/Editor: John F. Kain and John M. Quigley

Volume Publisher: NBER

Volume ISBN: 0-870-14270-4

Volume URL: <http://www.nber.org/books/kain75-1>

Publication Date: 1975

Chapter Title: Front matter, Housing Markets and Racial Discrimination: A Microeconomic Analysis

Chapter Author: John F. Kain, John M. Quigley

Chapter URL: <http://www.nber.org/chapters/c3710>

Chapter pages in book: (p. -22 - 0)

Housing Markets and Racial Discrimination: A Microeconomic Analysis

John F. Kain

NATIONAL BUREAU OF ECONOMIC RESEARCH *and*
HARVARD UNIVERSITY

John M. Quigley

NATIONAL BUREAU OF ECONOMIC RESEARCH *and*
YALE UNIVERSITY



Urban and Regional Studies Number 3

NATIONAL BUREAU OF ECONOMIC RESEARCH
New York 1975

DISTRIBUTED BY Columbia University Press
New York and London

Copyright © 1975 by the National Bureau of Economic Research
All Rights Reserved
Printed in the United States of America

DESIGNED BY JEFFREY M. BARRIE

Library of Congress Cataloging in Publication Data
Kain, John F.

Housing markets and racial discrimination.

(Urban and regional studies; no. 3)

Bibliography: p. 377-p. 385

Includes index.

1. Discrimination in housing—St. Louis metropolitan area. 2. Discrimination in housing—St. Louis metropolitan area—Mathematical models. 3. Housing—St. Louis metropolitan area—Mathematical models. I. Quigley, John M., joint author. II. Title. III. Series: Urban and regional studies (New York); no. 3.

HD7304.S2K34 301.5'4 75-17521

ISBN 0-87014-270-4

Housing Markets and Racial Discrimination: A Microeconomic Analysis

NATIONAL BUREAU OF ECONOMIC RESEARCH

Urban and Regional Studies

1. The Detroit Prototype of the NBER Urban Simulation Model
Gregory K. Ingram, John F. Kain, J. Royce Ginn
2. An Econometric Analysis of the Urban Housing Market
Mahlon R. Straszheim
3. Housing Markets and Racial Discrimination: A Microeconomic Analysis
John F. Kain and John M. Quigley

NATIONAL BUREAU OF ECONOMIC RESEARCH

OFFICERS

Arthur F. Burns, *Honorary Chairman*
J. Wilson Newman, *Chairman*
Moses Abramovitz, *Vice Chairman*
John R. Meyer, *President*
Thomas D. Flynn, *Treasurer*
Douglas H. Eldridge, *Vice President-Executive Secretary*
Gary Fromm, *Director, NBER-Washington*

Victor R. Fuchs, *Vice President-Research; Co-director, NBER-West*
Edwin Kuh, *Director, Computer Research Center*
Robert E. Lipsey, *Vice President-Research*
Harvey J. McMains, *Vice President; Director, NBER-New York*
Sherman J. Maisel, *Co-director, NBER-West*
Geoffrey H. Moore, *Vice President-Research*
Edward K. Smith, *Vice President*

DIRECTORS AT LARGE

Atherton Bean, *International Multifoods Corporation*
Andrew F. Brimmer, *Harvard University*
Arthur F. Burns, *Board of Governors of the Federal Reserve System*
Wallace J. Campbell, *Foundation for Cooperative Housing*
Erwin D. Canham, *Christian Science Monitor*
Emilio G. Collado, *Exxon Corporation*
Solomon Fabricant, *New York University*
Frank L. Fernbach, *United Steelworkers of America*
Eugene P. Foley, *Montrose Securities, Inc.*
David L. Grove, *International Business Machines Corporation*
Walter W. Heller, *University of Minnesota*
Vivian W. Henderson, *Clark College*

John R. Meyer, *Harvard University*
Geoffrey H. Moore, *National Bureau of Economic Research*
J. Wilson Newman, *Dun & Bradstreet, Inc.*
James J. O'Leary, *United States Trust Company of New York*
Rudolph A. Oswald, *American Federation of Labor and Congress of Industrial Organizations*
Alice M. Rivlin, *Congressional Budget Office*
Robert V. Roosa, *Brown Brothers Harriman & Co.*
Eli Shapiro, *The Travelers Corporation*
Arnold M. Soloway, *Jamaicaway Tower, Boston, Massachusetts*
Lazare Teper, *International Ladies' Garment Workers' Union*
Theodore O. Yntema, *Oakland University*

DIRECTORS BY UNIVERSITY APPOINTMENT

Moses Abramovitz, *Stanford*
Gardner Ackley, *Michigan*
Charles H. Berry, *Princeton*
Francis M. Boddy, *Minnesota*
Otto Eckstein, *Harvard*
Walter D. Fisher, *Northwestern*
R. A. Gordon, *California, Berkeley*
J. C. LaForce, *California, Los Angeles*

Robert J. Lampman, *Wisconsin*
Maurice W. Lee, *North Carolina*
Almarin Phillips, *Pennsylvania*
Lloyd G. Reynolds, *Yale*
Robert M. Solow, *Massachusetts Institute of Technology*
Henri Theil, *Chicago*
William S. Vickrey, *Columbia*

DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Eugene A. Birnbaum, *American Management Associations*
Thomas D. Flynn, *American Institute of Certified Public Accountants*
Nathaniel Goldfinger, *American Federation of Labor and Congress of Industrial Organizations*
Harold G. Halcrow, *American Agricultural Economics Association*
Walter E. Hoadley, *American Finance Association*

Philip M. Klutznick, *Committee for Economic Development*
Paul W. McCracken, *American Statistical Association*
Roy E. Moor, *National Association of Business Economists*
Douglass C. North, *Economic History Association*
Willard L. Thorp, *American Economic Association*
Robert M. Will, *Canadian Economics Association*

DIRECTORS EMERITI

Percival F. Brundage
Frank W. Fetter
Gottfried Haberler

Albert J. Hettinger Jr.
George B. Roberts

Murray Shields
Boris Shishkin
Joseph H. Willits

SENIOR RESEARCH STAFF

Gary S. Becker
Charlotte Boschan
Phillip Cagan
Stanley Diller
Solomon Fabricant
Milton Friedman
Gary Fromm
Victor R. Fuchs
J. Royce Ginn

Raymond W. Goldsmith
Michael Gort
Michael Grossman
F. Thomas Juster
John F. Kain
John W. Kendrick
Irving B. Kravis
Edwin Kuh
William M. Landes

Hal B. Lary
Robert E. Lipsey
Sherman J. Maisel
Benoit B. Mandelbrot
John R. Meyer
Robert T. Michael
Jacob Mincer
Ilse Mintz
Geoffrey H. Moore

M. Ishaq Nadiri
Nancy Ruggles
Richard Ruggles
Anna J. Schwartz
Robert P. Shay
Edward K. Smith
George J. Stigler
Robert J. Willis
Victor Zarnowitz

Relation of the Directors to the Work and Publications of the National Bureau of Economic Research

1. The object of the National Bureau of Economic Research is to ascertain and to present to the public important economic facts and their interpretation in a scientific and impartial manner. The Board of Directors is charged with the responsibility of ensuring that the work of the National Bureau is carried on in strict conformity with this object.

2. The President of the National Bureau shall submit to the Board of Directors, or to its Executive Committee, for their formal adoption all specific proposals for research to be instituted.

3. No research report shall be published until the President shall have submitted to each member of the Board the manuscript proposed for publication, and such information as will, in his opinion and in the opinion of the author, serve to determine the suitability of the report for publication in accordance with the principles of the National Bureau. Each manuscript shall contain a summary drawing attention to the nature and treatment of the problem studied, the character of the data and their utilization in the report, and the main conclusions reached.

4. For each manuscript so submitted, a special committee of the Directors (including Directors Emeriti) shall be appointed by majority agreement of the President and Vice Presidents (or by the Executive Committee in case of inability to decide on the part of the President and Vice Presidents), consisting of three Directors selected as nearly as may be one from each general division of the Board. The names of the special manuscript committee shall be stated to each Director when the manuscript is submitted to him. It shall be the duty of each member of the special manuscript committee to read the manuscript. If each member of the manuscript committee signifies his approval within thirty days of the transmittal of the manuscript, the report may be published. If at the end of that period any member of the manuscript

committee withholds his approval, the President shall then notify each member of the Board, requesting approval or disapproval of publication, and thirty days additional shall be granted for this purpose. The manuscript shall then not be published unless at least a majority of the entire Board who shall have voted on the proposal within the time fixed for the receipt of votes shall have approved.

5. No manuscript may be published, though approved by each member of the special manuscript committee, until forty-five days have elapsed from the transmittal of the report in manuscript form. The interval is allowed for the receipt of any memorandum of dissent or reservation, together with a brief statement of his reasons, that any member may wish to express; and such memorandum of dissent or reservation shall be published with the manuscript if he so desires. Publication does not, however, imply that each member of the Board has read the manuscript, or that either members of the Board in general or the special committee have passed on its validity in every detail.

6. Publications of the National Bureau issued for informational purposes concerning the work of the Bureau and its staff, or issued to inform the public of activities of Bureau staff, and volumes issued as a result of various conferences involving the National Bureau shall contain a specific disclaimer noting that such publication has not passed through the normal review procedures required in this resolution. The Executive Committee of the Board is charged with review of all such publications from time to time to ensure that they do not take on the character of formal research reports of the National Bureau, requiring formal Board approval.

7. Unless otherwise determined by the Board or exempted by the terms of paragraph 6, a copy of this resolution shall be printed in each National Bureau publication.

(Resolution adopted October 25, 1926, and revised February 6, 1933, February 24, 1941, April 20, 1968, and September 17, 1973)

Contents

Acknowledgments	xix
1. Introduction	1
Plan of the Analysis	7
2. A Theory of Urban Housing Markets and Spatial Structure	9
The Nature of Housing Output	13
Housing Production Relationships	20
Housing Demand and Residential Location	25
Some Simple Analytics	30
Housing Investment and Neighborhood Change	34
Some Key Assumptions	37
Summary	43
Appendix to Chapter 2: The Existence of Quasi Rents for Housing Attributes	45
3. Racial Discrimination in Urban Housing Markets	56
Introduction	56
Segregation in U.S. Cities	56
Determinants of Segregation	57
Price Discrimination and Housing Choices	61
Discrimination and Housing Prices	62
Determination of Ghetto Housing Prices	63
Boundary Effects and Short-Run Dynamics	72
Effects on Location Rents	82
Housing Quality, External Effects, and Collective Goods	82
Racial Discrimination and the Workplace Dominance Assumption	87
Summary	90

4. Characteristics of the Study Area and of the Data	92
Introduction	92
Characteristics of the Study Area	93
The Survey Instruments	100
The Sample Design	110
The City Subsample	110
Sampling Procedure for St. Louis County	114
A Brief Note on Weighting	114
Summary	116
5. Home Ownership, Home Purchase, and Household Mobility	118
The Life Cycle	121
Home Ownership, Home Purchase, and Household Mobility	122
Home Ownership	123
Home Purchase and Mobility	126
Mobility	127
The Conditional Probabilities of Purchase	130
Summary	135
6. Racial Discrimination and Home Ownership	137
Differences Among Metropolitan Areas	144
Home Ownership, Housing Costs, and Capital Accumulation	148
Other Evidence on Home Ownership and Wealth	151
Summary	152
7. Determinants of Housing Expenditures	154
Introduction	154
Expenditures by St. Louis Households	156
The Full Model	157
The Simple Model	167
Housing Expenditures by Black and White Households	172
Simple Models for Owners	177
The Full Models for Black and White Renters	178
The Full Models for Black and White Owners	183
Models with "Permanent Income"	183
Summary	188

8. The Value of Housing Attributes	190
The Measures of Housing Attributes	195
City Equations	202
The Value of Housing Attributes Inside and Outside the Ghetto	209
Stratification by Dwelling-Unit Size	217
Summary	228
9. The Demand for Individual Housing Attributes	231
Introduction	231
Empirical Analyses of the Demand for Housing Attributes	232
The Determinants of the Demand for Housing Attributes	234
Racial Differences in the Demand for Housing Attributes	240
The Demand for Dwelling-Unit Quality by Black Households	241
Racial Differences in the Demand for Dwelling-Unit Size	244
White and Black Demand for Neighborhood Attributes	246
Racial Differences in the Demand for Structure Types	247
Racial Discrimination and the Demand for Housing Attributes	251
Summary	254
10. Joint Estimation of the Demand for Attributes	256
Introduction	256
Definition of the Bundle Components	257
Estimation of the Demand for Bundle Components	263
Demand for Bundle Components by Blacks and Whites	268
Use of Value Weights to Define Bundle Components	273
Demand for Bundle Components by Owner-Occupants	279
Summary	281
11. Major Findings on the Structure of Urban Housing Markets and the Effects of Racial Discrimination	283
Introduction	283
The Nature of Housing Services	284
Determinants of Attribute Prices	286
Determinants of Housing Expenditures	287
Tenure Choice and Mobility	289
Demand for a Heterogeneous Housing Stock	290

Contents

xi

Implications of Racial Discrimination	293
Indirect Effects on Black Households	297
Some Concluding Observations	299

Appendixes:

A. Home Interview Schedules	303
B. Estimation of Value for Owner-Occupied Dwelling Units	317
C. Owning and Saving Versus Renting and Consuming	320
D. Weighted Expenditure Models	324
E. The Effect of Weighting on Attribute Prices	336
F. Rent and Value Models with Factor-Analytic Measures of Residential Quality	340
G. Attribute Demand Equations by Tenure Type	357
Demand for Dwelling-Unit Quality for Owners and Renters	360
Dwelling-Unit and Parcel Size	363
Demand for Neighborhood Attributes	366
Demand for Structure Types	369
H. Vacancy Rates Among Sampled Dwelling Units	374

Bibliography	377
--------------	-----

Index	387
-------	-----

Tables

2-1	Suburban-Central City Differences in Housing Prices in the San Francisco-Oakland SMSA by Characteristics of the Housing Bundle: Owner-Occupied and Rental Units	20
2-2	Moving Rates by Job-Change Characteristics and by Kind of Move for San Francisco Area Households	40
2-3	Rates of Intrametropolitan Mobility by Tenure, Age, and Job Change for San Francisco Households	41
2-4	Demands of City and Suburban Workers for High-Quality and Low-Quality Bundles in the City and in the Suburbs at Four Relative Prices	53
3-1	Percent of White and Black Families Living in the Suburban Ring of Eleven Large SMSA's in 1970	59
3-2	The Sources of Ghetto Housing Supply by Region in 1960 Since 1950	64
3-3	Discrimination Markups Paid by Nonwhite Occupants' in 10 Large Metropolitan Areas—1960	67
3-4	Change in White and Nonwhite Central-City and Suburban-Ring Populations 1950-60	85
4-1	Characteristics of Major Subdivisions of the St. Louis Metropolitan Area: 1970	96
4-2	Number of Unusable Home Interviews by Reason	101
4-3	Characteristics of Neighborhood School, Crime, and Accessibility Measures	109
4-4	Distribution of Private-Housing Sample Blocks	112
4-5	Distribution of Private-Housing Sample Dwelling Units	113
4-6	Summary of the County Residential-Dwelling-Unit Sample	115
4-7	Unweighted and Weighted Means for Renters and Owners in St. Louis City and County	116
5-1	Ordinary Least-Squares and Generalized Least-Squares Estimates of the Probability of Home Ownership	124
5-2	Generalized Least-Squares Estimates of the Probability of Moving for All Households: Prior Owners, Prior Renters, and Prior Tenure Unknown	128

5-3	Generalized Least-Squares Estimates of the Probability of Purchase for Recent Movers with and Without Prior Tenure	131
5-4	Changes in the Probability of Home Purchase by Family Size and Number of School-Age Children	132
6-1	Generalized Least-Squares Estimates of the Probability of Home Ownership and Home Purchase Using a Measure of Permanent Income	141
6-2	Coefficients and <i>t</i> Ratios of Race Variable in Equations Using Alternative Specifications of Income: Ordinary Least-Squares and Generalized Least-Squares	143
6-3	Actual and "Expected" Ownership Rates of Black Households by Metropolitan Area	145
6-4	Means and Standard Deviations of Variables Used in Intercity Regressions	147
7-1	Alternative Specifications of the Full Model of Housing Expenditures for Renters and Owners	158
7-2	Alternative Specifications of the Simple Models of Housing Expenditures for Renters and Owners	168
7-3	Alternative Specifications of the Simple Models of Housing Expenditures for White and Black Renters	174
7-4	Alternative Specifications of the Simple Models of Housing Expenditures for White and Black Owners	176
7-5	Alternative Specifications of the Full Model of Housing Expenditures for White and Black Renters	181
7-6	Alternative Specifications of the Full Model of Housing Expenditures for White and Black Owners	184
7-7	Summary of Models of Housing Expenditures with Permanent Income for Renters and Owners	186
7-8	Effect on the Race Coefficient of Adding Permanent Income to Models of Housing Expenditures for Renters and Owners	187
7-9	"Expected" Black House Values and Rents Obtained by Solving White Equations Using Black Means	187
8-1	Means and Standard Deviations of Housing Attributes for Renter and Single-Family Owner-Occupied Units in the City	196
8-2	Alternative Specifications of Rent and Value Models for the City	200
8-3	Linear Specifications of Rent and Value Equations for Ghetto and Nonghetto Units	210
8-4	Semilog Specifications of Rent and Value Equations for Ghetto and Nonghetto Units	213
8-5	Estimated Ghetto Markups for Housing Bundles from Stratified Models	216
8-6	Means of Housing Attributes by Number of Rooms for Renters of Ghetto and All Nonghetto Properties	220
8-7	Means of Housing Attributes by Number of Rooms for Owners of Ghetto and All Nonghetto Properties	221

8-8	Rent and Value Equations by Number of Rooms for All Nonghetto Properties	222
8-9	Additive Rent and Value Equations by Number of Rooms for All Nonghetto Properties	225
9-1	Means and Standard Deviations of Individual Attributes for All Occupied Dwellings	235
9-2	Least-Squares Estimates of the Demand for Housing Attributes by All Households	236
9-3	Means and Standard Deviations of Individual Attributes for White and Black Pooled Tenure Types	242
9-4	Least-Squares Estimates of the Demand for Dwelling-Unit Quality by White and Black Households	243
9-5	Least-Squares Estimates of the Demand for Dwelling-Unit Size by Black and White Households	245
9-6	Least-Squares Estimates of the Demand for Neighborhood Attributes for Black and White Households	248
9-7	Least-Squares Estimates of the Demand for Structure Type by Black and White Households	250
9-8	Estimated Values of Housing Attributes Obtained from Solving the White Attribute Demand Equations Using Mean Values of the Black Sample	253
10-1	Means and Standard Deviations of Bundle Components for All St. Louis Households, Blacks, and Whites	261
10-2	Modified Estimates of Bundle Components for All Households, Blacks, and Whites, Using Different Allocations of the Constant Term	263
10-3	Seemingly-Unrelated-Regression (SURE) and Ordinary-Least-Squares (OLS) Estimates of Bundle Components for All Households	265
10-4	Effect of Specified Changes in Explanatory Variables as a Percentage of the Mean Consumption of Each Bundle Component by All Households	266
10-5	Seemingly Unrelated Regression Estimates of Bundle Components for Black and White Households	269
10-6	Effect of Specified Changes in Explanatory Variables as a Percentage of the Mean Consumption of Each Bundle Component by Blacks and Whites	271
10-7	Actual Mean Black and White Consumption of Bundle Components and Estimated Black Consumption Using Black Means in White Equations	273
10-8	Means and Standard Deviations of Bundle Components of Owner-Occupied Single Detached Units, Based on Value Weights; Compared with Mean Quantities, Based on Implicit Gross Rent Multiplier; and Mean Quantities for All Units, Rental Units, and Owners, Based on Rental Weights	276
10-9	Quantities of Bundle Components for All Housing Units,	

	Rental Units, and Single Detached Owner-Occupied Units After Allocation of Constant Terms	277
10-10	Seemingly Unrelated Regression Estimates of Bundle Com- ponents for Owner-Occupied Single Detached Units with De- flated Owner Weights	279
10-11	Effect of Specified Changes in Explanatory Variables as a Percentage of the Mean Consumption of Each Bundle Com- ponent by Owners of Single Detached Units	280
B-1	Summary Statistics of Valuation of Owned Single-Family Detached Housing	318
D-1	Mean Income, Rent, Value, and Proportion Black for Weighted and Unweighted Samples of St. Louis Households	326
D-2	Alternative Specifications of Simple Expenditure Models for Renters, Using Weighted and Unweighted Samples	327
D-3	Alternative Specifications of Simple Expenditure Models for Owners of One-Family Units, Using Weighted and Unweighted Samples	328
D-4	Alternative Specifications of Simple Expenditure Models for Black and White Renters, Using Weighted and Unweighted Samples	330
D-5	Alternative Specifications of Simple Expenditure Models for Black and White Owners, Using Weighted and Unweighted Samples	332
D-6	Summary of Estimated Income Elasticities for Renters	333
D-7	Summary of Estimated Income Elasticities for Owners	333
E-1	Weighted and Unweighted Rent and Value Models for the Entire Nonghetto and Ghetto Samples: Linear Specifications	338
F-1	Matrix of Simple (Zero-Order) Correlation Coefficients Be- tween Quality Measures	342
F-2	Factor Loadings on Individual Quality Variables	348
F-3	Linear Rent and Log-Log Value Equations for City Units	351
F-4	Rent Equations for Entire Sample (Including Suburban St. Louis County Observations) and for City Without School and Crime Variables	355
F-5	Value Equations for Entire Sample and for City Units Without School and Crime Variables	356
G-1	Means and Standard Deviations of Individual Attributes for All Owner- and Renter-Occupied Dwellings	359
G-2	Least-Squares Estimates of the Demand for Attributes of Dwelling-Unit Quality by Renters and Owners	361
G-3	Least-Squares Estimates of the Demand for Dwelling-Unit Size by Renters and Owners	364
G-4	Least-Squares Estimates of the Demand for Neighborhood Attributes by Renters and Owners	367
G-5	Least-Squares Estimates of the Demand for Structure Types by Renters and Owners	370

G-6	Number of Significant Coefficients in Attribute Equations for Renter and Owner-Occupied Dwelling Units and for All Units	373
H-1	Vacancies by Structure Type for City Samples	374
H-2	Exterior Condition of Vacant Units	375
H-3	Percentage of Vacant Dwelling Units by Structure Type and Exterior Condition	375

Figures

2-1	House Prices	30
2-2	Travel Costs	31
2-3	Gross Prices	32
2-4	House Prices and Travel Costs for Two Workplaces	32
2-5	Gross Prices for Two Workplaces	33
2-6a	Supply and Demand Relationships for City Properties if Transport Costs Equal 5 and Transformation Costs Equal 10	48
2-6b	Supply and Demand Relationships for Suburban Properties if Transport Costs Equal 5 and Transformation Costs Equal 10	48
2-7a	Supply and Demand Relationships for City Properties if Transformation Costs Differ for High- and Low-Quality Bundles	49
2-7b	Supply and Demand Relationships for Suburban Properties if Transformation Costs Differ for High- and Low-Quality Bundles	50
2-8a	Supply and Demand Relationships for City Properties Given Two Workplaces and Two Kinds of Housing	51
2-8b	Supply and Demand Relationships for Suburban Properties Given Two Workplaces and Two Kinds of Housing	51
3-1	Relative-Price Index (Test Area/Control Area) with Two Regression Lines	77
3-2a	Relative-Price Index by Degree of Transition, University City, Missouri, 1953-67	79
3-2b	Number of Transactions by Degree of Transition, University City, Missouri, 1953-67	80
3-3	Ratio of Sales Price to Base Price and Number of Transactions by Integrated and Unintegrated Areas of the Normandy District, by Year	81
4-1	St. Louis Standard Metropolitan Statistical Area	94
4-2	Population of the City of St. Louis, St. Louis County, and the Balance of the St. Louis SMSA (as Defined in 1970) from 1910 to 1970	97
4-3	Black and White Population of St. Louis County and the City of St. Louis from 1910 to 1970	98

4-4	Percent Black by Census Tract in 1970 for St. Louis City and County	99
4-5	St. Louis Community Renewal Program: Physical Blight Parcel Survey	104
4-6	St. Louis Community Renewal Program: Environmental Block Face Survey	106
5-1	Mobility and Purchase Probabilities for One-Thousand Households with Identical Given Socioeconomic Characteristics	135
7-1	Estimated Monthly Housing Expenditures for All Renters by Annual Income, Based on Alternative Specifications of the Full Model	162
7-2	Estimated Monthly Housing Expenditures for All Owners by Annual Income, Based on Alternative Specifications of the Full Model	163
7-3	Estimated Monthly Housing Expense for White and Black Renters by Annual Income, No Utilities Except Water Included in Rent, Based on Alternative Specifications	175
7-4	Estimated Value of Single-Family Owner-Occupied Units for Black and White Owners by Income, Based on Alternative Specifications	179
7-5	Mean Family Income by Years of Schooling of Head for White and Black Households	180
10-1	Estimated Linear and Hypothesized Nonlinear Relationships Between Rent and Structure Age	262
A-1	Home Interview Schedules	303

Acknowledgments

In any research project of the duration, scale, and complexity of the one summarized by this book, the analysts invariably benefit from the advice and efforts of more persons than they can hope to acknowledge or even recall. This has certainly been our experience, and in acknowledging our debts to some we run the risk of omitting others whose contributions were nearly as valuable. Still, the contributions of a few individuals are so great that we must acknowledge them even at the risk of overlooking others.

Our earliest debt is to Walter Hansen of Alan Voorhees and Associates, who involved us as consultants to the St. Louis Community Renewal Program (CRP) in the summer of 1967. That study provided the raw data used in the empirical analyses presented in this book. During 1967-68 we acquired a heavy debt to the staff of the St. Louis CRP, who worked with us in collecting these data, and who agreed to allow us to use them for the analyses presented here.

William McNaught, Margie Dewar, and Laura Steig, who worked with us as research assistants at various times during this period, made major contributions to the processing and analysis of the St. Louis sample and to the preparation of the manuscript itself.

Throughout the long period of research and manuscript preparation, we received nearly constant advice, suggestions, and encouragement from other members of the NBER urban studies group and particularly J. Royce Ginn, H. James Brown, Gregory K. Ingram, William G. Apgar, Jr., and Mahlon Straszheim.

The National Bureau's Advisory Committee for Urban Studies aided in a variety of ways, but especially in helping us maintain perspective on our work. The members of the Advisory Committee are Wallace J. Campbell, William G. Colman, Anthony Downs, Nathan Glazer, Charles M. Haar, Frederick O. R. Hayes, Vivian W. Henderson, Saul B. Klamman, Sherman J. Maisel, Peter F. McNish, Boris Shishkin, Norman Strunk, Leo J. Troy, Phylis Wallace, James Q. Wilson, and Kenneth M. Wright. The style, content, and readability of

this book were greatly enhanced by the critical advice of Mahlon Straszheim, John R. Meyer, and Frank de Leeuw, who as members of the staff reading committee agreed to read and to comment on the entire manuscript. Emilio G. Collado, Wallace J. Campbell, and Philip N. Klutznick comprised the directors' reading committee.

Financial support for the project was provided by U.S. Department of Housing and Urban Development Grant NY-MTD 15, administered by the Office of Urban Transportation Development and Liaison, Division of Systems Research and Development, and by unrestricted funds of the National Bureau. Quigley also worked on revisions to the manuscript while on a Foreign Area Fellowship; he further acknowledges assistance from the Industrial Institute for Social and Economic Research, Stockholm, and particularly from Lars Nabseth.

The charts and maps were drawn by H. Irving Forman, and the manuscript was skillfully edited by Ruth Ridler.

Housing Markets and Racial Discrimination: A Microeconomic Analysis

