

## **CONTENTS**

		page
	List of Tables	х
	List of Tables  List of Figures	
	Foreword	xv xvii
	Preface	xxi
	Conventions	xxiv
	Conventions	XXIV
1	INTRODUCTION Terry Barker	1
1.1	Structural Change in the British Economy	1
1.2	A Model of Economic Structure and Change	4
1.3	The Plan of the Book	9
	PART I THE MODEL AS A SYSTEM	
2	THEORY AND METHOD Terry Barker and William	
	Peterson	13
2.1	Modelling the Economy	13
2.2	Disaggregation	15
2.3	A Comparison of Multisectoral Models	19
2.4	A Comparison with Other Models of the British Economy	23
3	THE ACCOUNTING FRAMEWORK AND THE DATA	
	Terry Barker and Martin Weale	25
3.1	The Accounting Framework	25
3.2	The United Nations' System of National Accounts	26
3.3	The Classifications Adopted	30
3.4	The Construction of the Accounts	34
3.5	Input-Output Tables, Classification Converters and	
	Indirect Tax Rates	36
3.6	The Derivation of the Time-Series Data	43
3.7	Accounting for Price Changes	43
3.8	Conclusion	46



vi	CONTENTS	
4	THE COMPLETE MODEL Terry Barker	47
4.1	Introduction	47
4.2	A Summary of the Economics of the Model	47
4.3	The Structure of the Model	50
4.4	The Main Economic Relationships	53
4.5	Different Versions of the Model	63
4.6	Dynamic Multipliers	68
4.7	Tests on Adjustments and Internal Dynamics	78
4.8	Uses of the Model	82
5	ESTIMATION William Peterson	87
5.1	Introduction	87
5.2	Structural Specification and Economic Theory	89
5.3	Deterministic and Stochastic Equation Dynamics	92
5.4	Systems of Interrelated Equations	96
5.5	Testing for Structural Stability	101
6	COMPUTER SOFTWARE FOR A LARGE	
	ECONOMETRIC MODEL William Peterson	105
6.1	Introduction	105
6.2	Flexibility in Model Specification	109
6.3	Flexibility in model use	113
6.4	Conclusions	119
PA	RT II DIFFERENT ECONOMIC SECTORS OF THE MO	DEL
7	CONSUMERS' EXPENDITURE Vani Borooah	125
7.1	Introduction	125
7.2	The Rotterdam Model	129
7.3	The Data and Commodity Groupings	132
7.4	Estimating and Testing the Rotterdam System for the UK	133
7.5	A Model of Aggregate Consumers' Expenditure	136
7.6	Coefficient Estimates of the Consumption Function	138
7.7	Summary and Conclusions	140
	Appendix 7.1 Results for Testing the Restrictions of	
	Demand Theory	141
	Appendix 7.2 Estimation Results	145
8	FIXED INVESTMENT William Peterson	151
8.1	Introduction	151
8.2	The Cost of Capital and the Role of Profitability	153



	CONTENTS	vii
8.3 8.4	The Empirical Analysis of Industrial Fixed Investment Social-Capital Formation and Other Investment	157 179
9	STOCKBUILDING Michael Landesmann	185
9.1	Introduction	185
9.2	An Economic Model of Inventory Behaviour	186
9.3	The Estimation of the Inventory Model	190
9.4	Some Remarks on the Results Obtained	198
9.5	The Properties of the Estimated Stock Adjustment Model	199
10	EXPORTS AND IMPORTS Terry Barker	201
10.1	Foreign Trade in the UK Economy	201
10.2	Modelling Foreign Trade	202
10.3	The Data Used in Estimating the Trade Equations	206
10.4	Definitions and Restriction Tests for the Export-Quantity	
	Equations	208
10.5	Estimates of the Export-Quantity Equations	212
10.6	A Comparison of the Export Elasticities with Other	
	Published Results	221
10.7	Definitions and Properties of the Import-Ratio Equations	223
10.8	Restrictions on the Import-Ratio Equations	227
10.9	Estimates of the Import-Ratio Equations	230
10.10	A Comparison of the Import Elasticities with Other	
	Published Results	233
10.11	The Direct Responses of Exports and Imports to a Sterling Devaluation	239
11	EMPLOYMENT William Peterson	247
11.1	Introduction	247
11.2	A Theoretical Framework for the Employment Decision	249
11.3	The Determinants of Average Hours	252
11.4	Forecasting the Level of Employment	257
11.5	Total Employment and Unemployment	268
12	THE DEMAND FOR ENERGY William Peterson	275
12.1	Introduction	275
12.2	An Econometric Model of Fuel Substitution	277
12.3	Estimates of the Energy-Demand Model	282
13	INDUSTRIAL PRICES AND PROFITS Martin Weale	293
13.1	Introduction	293



viii	CONTENTS	
13.2	The Determination of Prices and Profits	294
13.3	The Price Functions and their Estimation	298
13.4	Data Construction	301
13.5	The Normal-Cost Hypothesis	302
13.6	The Role of Import Competition in Manufacturing Price	
	Formation	305
13.7	The Parameter Estimates	305
13.8	Conclusions	307
14	EXPORT AND IMPORT PRICES Terry Barker	311
14.1	The Determination of Export and Import Prices	311
14.2	The Definitions of the Price Equations and the Data	314
14.3	Restrictions on the Price Equations and the 'Law of One	
	Price'	318
14.4	Restrictions on the Export-Price Equations	321
14.5	Estimates of the Export-Price Equations	321
14.6	A Comparison of the Export-Price Responses with Other	
	Published Estimates	330
14.7	Restrictions on the Import-Price Equations	330
14.8	Estimates of the Import-Price Equations	334
14.9	A Comparison of the Import-Price Responses with Other	
	Published Estimates	336
15	INCOMES POLICY AND EARNINGS Tony Lawson	341
15.1	Introduction	341
15.2	An Aggregate-Earnings Equation	342
15.3	Deriving a Strength-of-Incomes-Policy Series 1955-79	345
15.4	The Estimated Aggregate-Earnings Equation 1955-79	354
15.5	Industrial Wage Rates	361
15.6	1979 and After	362
15.7	Conclusion	371
16	SOCIAL SECURITY BENEFITS AND PERSONAL	
	INCOME TAX Don Sharpe	373
16.1	Introduction	373
16.2	The Income-Outlay Loop	374
16.3	UK Direct Taxes on Household Income	376
16.4	Government Grants	381
16.5	Occupational Pensions	385



	CONTENTS	ix
17	THE COMPANY SECTOR Andrew Goudie, Geoffrey	
	Meeks and Martin Weale	389
17.1	The Company Sectors in the Model	389
17.2	The Accounting Framework and the Data	390
17.3	The Sectoral Model for Industrial and Commercial	
	Companies' Income and Expenditure	391
17.4	The Individual-Companies Model	396
17.5	Costs and Benefits of the Optional Disaggregated Model	404
17.6	Income Receipts and Payments by the Financial Sector	408
18	FINANCIAL STOCKS AND RETURNS Martin Weale	411
18.1	Introduction	411
18.2	The Accounting Framework	412
18.3	Model Structure	412
18.4	Data	415
18.5	Revaluations and Coupon Payments	415
18.6	Interest-Rate Functions	419
18.7	The Stock of Financial Assets and its Portfolio Allocation	423
18.8	Function Specification and Estimation	424
18.9	A Simple Model of Portfolio Allocation	427
	Current Research	429
19	STERLING EXCHANGE RATE Andrew Snell	433
19.1	Introduction	433
19.2	Structural Versus Single-Equation Approaches	434
19.3	Current Practice in Single-Equation Models of the	
10	Exchange Rate	435
19.4	An Exchange-Rate Equation for Sterling	437
19.5	Estimates of the Model	439
19.6	A Numerical Experiment	449
19.7	Summary and Conclusion	452
	Appendix 19.1	453
	Appendix: The Definition of Industries in MDM6	455
	List of Variables in MDM6	456
	Bibliography	473
	Index of Authors	498
	Index of Subjects	503
	· ·	



## **TABLES**

3.1	The Aggregated System of National Accounts for the UK,	
	1975 (£m)	28
3.2	SNA Classifications in MDM6	31
3.3	Classifications in MDM6	32
3.4	IDIOM and MDM: Classification Converters and Parameter	
	Matrices arranged in a SNA	38
4.1	Variable and Equation Count, MDM6	50
4.2	Principal Exogenous Variables in MDM6	52
4.3	Policy Effects on UK Unemployment in Different Versions of	•
	the Model	64
4.4	The Effect of Adjustments to a Model Forecast	79
6.1	Principal Solution Blocks in MDM6	110
6.2	Replacing the Exchange-rate Equation	113
6.3	Running a Simple Model over a Ten-year Horizon	115
6.4	Adding a New Specification for Employment	116
6.5	The Control of Data Input and Tabulation	117
7.1	Budget Shares of 11 Broad Commodity Groups	126
7.2	Expenditure and Own-price Elasticities for the Broad Groups	134
7.3	Equations for Total Consumption	139
7.4	Testing Restrictions on the Broad Groups	141
7.5	Testing Restrictions on Group 1	142
7.6	Testing Restrictions on Group 2	142
7.7	Testing Restrictions on Group 3	142
7.8	Testing Restrictions on Group 4	143
7.9	Testing Restrictions on Group 5	143
7.10	Testing Restrictions on Group 6	143
7.11	Testing Restrictions on Group 7	144
7.12	Testing Restrictions on Group 8	144
7.13	Testing Restrictions on Group 9	144
	Testing Restrictions on Group 10	145
	Expenditure and Own-price Elasticities for Group 1 (Food)	145
7.16	Expenditure and Own-price Elasticities for Group 2 (Vices)	146



	TABLES	xi
7.17	Expenditure and Own-price Elasticities for Group 3 (Housing)	146
	Expenditure and Own-price Elasticities for Group 4 (Fuels) Expenditure and Own-price Elasticities for Group 5	146
	(Clothing) Expenditure and Own-price Elasticities for Group 6	147
	(Durables) Expenditure and Own-price Elasticities for Group 7	147
	(Household Goods) Expenditure and Own-price Elasticities for Group 8	147
	(Reading Matter) Expenditure and Own-price Elasticities for Group 9	148
	(Transport) Expenditure and Own-price Elasticities for Group 10	148
	(Commodities)	148
1.23	Expenditure and Own-price Elasticities for Group 11 (Miscellaneous)	149
8.1	Gross Fixed-Capital Formation 1961-85 (£bn 1975 prices and % p.a.)	152
8.2	Definitions for the Industrial Investment Equations	158
8.3	Coefficients of the Accelerator Functions for Buildings	160
8.4	Coefficients of the Accelerator Functions for Plant	161
8.5 8.6	Coefficients of the Accelerator Functions for Road Vehicles Coefficients of the Accelerator Functions for Other	162
8.7	Vehicles Coefficients of the Neoclassical III Functions for Buildings	163
8.8	and Plant Coefficients of the Neoclassical I Functions for Buildings	168
8.9	and Plant Coefficients of the Neoclassical II Functions for Buildings	170
	and Plant Coefficients of the Profitability I Functions for Buildings	172
	and Plant Coefficients of the Profitability II Functions for Buildings	174
	and Plant	176
0.12	Social-Capital Formation 1971-83 at 1975 Prices (annual % growth £1975m)	180
8.13	Equations of the Building Society Model	182
	Transfer Costs of Building and Land	183



X11	TABLES	
9.1 9.2	Stockbuilding in Relation to GDP and its Other Components Definitions for the Stockbuilding Equation	187 191
9.3	Coefficients Estimates of Model (9.10): Stockbuilding of Raw Materials and Fuels	192
9.4	Coefficients Estimates of Model (9.10): Stockbuilding Work in Progress	194
9.5	Coefficients Estimates of Model (9.10): Stockbuilding in Finished Goods	196
9.6	Weighted Industry Average Parameter Estimates	199
10.1	The Pattern of UK Trade 1954-81 (£bn 1975 prices and per cent)	202
10.2	Countries and Areas taken as Destinations and Sources for UK Trade	204
10.3	Definitions for the Export-Quantity Equations	209
10.4	Restrictions on the Export-Quantity Equations	210
10.5	A Comparison of Unrestricted and Forecasting Export-	210
10.0	Quantity Equations, UK 1956-81	214
10.6	Parameter Stability for Aggregated Export-Quantity	21.
2010	Equations	216
10.7	Elasticities and Summary Statistics for Export-Quantity	210
	Equations	218
10.8	A Comparison of Some Published Estimates of UK Export-	-10
	Quantity Responses	220
10.9	Definitions for the Import-Ratio Equations	224
	Restrictions on the Import-Ratio Equations	228
	A Comparison of Unrestricted and Forecasting Import-Ratio Equations, UK 1958-81	231
10.12		231
	Parameter Stability for Aggregated Import-Ratio Equations Elasticities and Summary Statistics for Import-Ratio	
10 14	Equations	234
10.14	A Comparison of Some Published Estimates of UK Import-	226
10.15	Quantity Responses	236
	Direct Price Effects on Exports of a 10% Devaluation	242
10.16	Direct Price Effects on Imports of a 10% Devaluation	245
11.1	Definitions for the Hours-Worked Equation (11.10)	255
11.2	Coefficients of the Hours-Worked Functions	256
11.3	Definitions for the Employment Equations	261
11.4	Coefficients of the Employment Functions	264
11.5	Characteristics of the Preferred-Employment Functions	267



	TABLES	xiii
11.6 11.7	Employment Change Decomposition for 1981 Government Employment by Expenditure Category	269 270
11.8	The Composition of Industrial Employment	272
12.1	Log-likelihood Values for Translog Fuel Models	283
12.2 12.3	Coefficient Signs for the Translog Models	287
12.3	Price Elasticities for the Translog Models	288
12.4	Definitions for the Aggregate Energy Equations Coefficients of the Aggregate Energy-Demand Functions	289 290
13.1 13.2	Definitions for the Industrial-Price Equations Log-Likelihood Functions Testing the Normal-Cost	299
	Hypothesis	304
13.3	Manufacturing Industries with a Significant Response to Import-Price Competition	306
13.4	The Estimated Coefficients of the Price Equations	308
14.1	Definitions for the UK Export-Price Equations	315
14.2	Definitions for the UK Import-Price Equations	316
14.3 14.4	Restrictions on the Export- and Import-Price Equations A Comparison of Unrestricted and Forecasting Export-	319
	Price Equations, UK 1956-81	324
14.5 14.6	Parameter Stability for Aggregated Export-Price Equations Elasticities and Summary Statistics for Export-Price	326
	Equations	327
14.7	A Comparison of Some Published Estimates of UK Export- Price Responses	328
14.8	A Comparison of Unrestricted and Forecasting Import- Price Equations, UK 1956-81	332
14.9	Parameter Stability for Aggregated Import-Price Equations	335
14.10	Elasticities and Summary Statistics for Import-Price Equations	337
14.11	A Comparison of Some Published Estimates of UK Import-	
	Price Responses	338
15.1	The Calculation of the Government's Implicit Target	349
15.2	Reduction in Wage Inflation The Incomes-Policy Dummy Variable	352
15.2	The Strength-of-Incomes-Policy Index 1955-79	353
15.4	Unrestricted and Restricted Estimates of the Aggregate	223
1J.4	Omesured and resulted Estimates of the Agglegate	



xiv	TABLES	
	Earnings Equation	356
15.5	Fully Restricted Estimates of the Equation	358
15.6	The Final Incomes-Policy Index	359
15.7	A Test of Structural Change in the Preferred-Earnings	00)
	Equation	360
15.8	Definitions for the Industrial Earnings Equations	363
15.9	Estimated Effects and Summary Statistics for the Industrial	
	Average-Earnings Equations	364
15.10	Four-sector Aggregated Effects and Summary Statistics for	
	the Industrial Average-Earnings Equations	365
15.11	A Summary of the Parameters of the Industrial	
	Average-Earnings Equations	365
15.12	Re-estimation of the Aggregate-Earnings Equation on Blue	
	Book Data 1955-79	368
15.13	Estimates of a Direct Unemployment Effect, 1955-81	368
	Estimates of an Incomes Policy Effect	370
	Estimates of a Shift in Equation Structure	370
	1	
16.1	Income-Outlay Loop: Form of Income with Paying and	
	Receiving Sectors	375
16.2	Household Sector: Transfer Forms of Income, 1975 and	
	1980 (£ million)	376
	`	
18.1	Financial Assets in MDM6	416
18.2	Definitions for the Interest-Rate Equations	421
18.3	Interest-Rate Functions	422
18.4	Definitions for the Aggregate Financial-Asset and Liability	
	Equations	425
18.5	Aggregate Asset and Liability-Stock Equations	426
18.6	Estimates of Interest Semi-Elasticities of Demand for	
	Holdings of Short-Term Assets by the Personal Sector	430
18.7	The Effect of a 1 Percentage Point Rise in the Yield on	
	10-Year Gilts (shown as a percentage of initial wealth)	431
19.1	Estimates of the Quarterly Model (19.2)	444
19.2	Definitions for the Sterling Exchange-Rate Equations	448
19.3	The Within-Equation Responses of the Dollar-Sterling Rate	450
19.4	The Quarterly Model for Exports and the Interest Rate	453
19.5	Definitions for the Treasury-Bill-Rate Equation	454



## **FIGURES**

1.1	Growth in the British Economy, 1955-82	2
1.2	Price Inflation in the British Economy, 1955-82	3
1.3	Some Economic Relationships in MDM for One Industry	2 3 5 6
1.4	Some Interrelationships between Industries in MDM	6
4.1	The Response of Industrial Investment to a 10% Rise in	
	Industrial Output from the Summary Equation	55
4.2	Effects on UK GDP of Changes in Fiscal Instruments using	
	Different Versions of MDM6	70
4.3	Effects on UK GDP of Changes in International and	
	Domestic Inflation Assumptions using Different Versions	
	of MDM6	71
4.4	Effects on UK Consumer Prices of Changes in Fiscal	
	Instruments using Different Versions of MDM6	72
4.5	Effects on UK Consumer Prices of Changes in International	
	and Domestic Inflation Assumptions using Different Versions	
	of MDM6	73
4.6	Effects on UK Unemployment of Changes in Fiscal	
	Instruments using Different Versions of MDM6	75
4.7	Effects on UK Unemployment of Changes in International	
	Assumptions using Different Versions of MDM6	76
4.8	Effects on UK Unemployment and Inflation of Changes in	
	Fiscal Instruments 1985-95 using Different Versions of MDM6	77
4.9	Stability Tests on MDM6	81
4.10	Stability Tests with Different Versions of MDM6	82
7.1	Savings Ratio, Inflation and the Rate of Growth of Real	
	Personal Disposable Income in the United Kingdom,	
	1965-81	128
10.1	Volume of UK Exports and Imports and Industrial	
	•	207
10.2		211
10.3	Distributions of Activity and Price Elasticities for UK	
	Exports	222



xvi	FIGURES	
10.4	The Activity Elasticity of Imports varying with the Share of Imports in Demand	227
10.5	Restriction Map for Import-Ratio Equations	229
10.6	Distribution of Activity and Price Elasticities for UK	227
10.0	Imports	238
10.7	Direct Effects on Import Prices and Volumes of a 10%	
	Sterling Devaluation	240
10.8	Direct Effects on Export Prices and Volumes of a 10%	
	Sterling Devaluation	244
14.1	The Sterling-Dollar Exchange Rate and Export and Import	
	Prices, UK 1954-81	317
14.2	Foreign Prices and UK Domestic Unit Labour Costs,	
	1954-81	318
14.3	Restriction Maps for Export-Price Equations	322
14.4	Restriction Maps for Import-Price Equations	331
15.1	Paths of Average Real Earnings	351
15.2	The Catch-up Coefficient and the Target Growth Rate in	
	the Earnings Equation	360
19.1	Dollar-Sterling and Effective Exchange Rates and	
	Relative Prices, Quarterly, 1972 to 1984	441
19.2	Interest Rate Differentials and the Balance of Payments,	
	Quarterly, 1972 to 1984	442
19.3	The Effects of a 1 Percentage Point Increase in US Interest	
	Rates on UK Exchange Rates, Prices and Wages	451
19.4	The Effect of a 1 Percentage Point Decrease in US Interest	
	Rates on UK Balance of Payments and GDP	452