

# CONTENTS

Preface	xiii
<b>CHAPTER 1 INTRODUCTION TO ECONOMIC DYNAMICS</b>	<b>1</b>
1.1 A short primer on MATLAB®	5
<b>CHAPTER 2 THE COBWEB MODEL</b>	<b>15</b>
2.1 Economic problem	15
2.2 Modelling	19
2.3 Analysis, simulation and visualisation	21
2.3.1 Cobweb plots	26
2.4 Concluding remarks, extensions and challenges	29
<b>CHAPTER 3 EXPECTATION DYNAMICS IN THE COBWEB MODEL</b>	<b>33</b>
3.1 Economic problem	33
3.2 Modelling	35
3.3 Analysis, simulation and visualisation	36
3.3.1 Cobweb plots	42
3.4 Concluding remarks, extensions and challenges	44
<b>CHAPTER 4 KEYNESIAN MULTIPLIER MODEL</b>	<b>47</b>
4.1 Economic problem	47
4.2 Modelling	50
4.3 Analysis, simulation and visualisation	54
4.4 Concluding remarks, extensions and challenges	57
<b>CHAPTER 5 THE IS/LM MODEL</b>	<b>61</b>
5.1 Economic problem	61
5.2 Modelling	63
5.3 Analysis, simulation and visualisation	67
5.4 Remarks, extensions and challenges	74

## CONTENTS

<b>CHAPTER 6 DEBT, DEFICIT AND STABILISATION POLICY</b>	<b>79</b>
6.1 Economic problem	80
6.2 Modelling	81
6.3 Analysis, simulation and visualisation	83
6.3.1 Simulation and visualisation	87
6.4 Concluding remarks, extensions and challenges	89
<b>CHAPTER 7 EXPECTATION DYNAMICS AND HYPERINFLATION</b>	<b>91</b>
7.1 Economic problem	91
7.2 Modelling	93
7.3 Analysis, simulation and visualisation	95
7.3.1 The naive expectation model	95
7.3.2 The perfect foresight model	97
7.3.3 Analysis of the rational expectation model	99
7.3.4 Simulation and visualisation	104
7.4 Concluding remarks, extensions and challenges	106
<b>CHAPTER 8 THE DORNBUSCH EXCHANGE RATE OVERSHOOTING MODEL</b>	<b>109</b>
8.1 Economic problem	109
8.2 Modelling	112
8.2.1 Commodity price dynamics	114
8.3 Analysis, simulation and visualisation	116
8.4 Concluding remarks, extensions and challenges	122
<b>CHAPTER 9 THE SOLOW-SWAN GROWTH MODEL</b>	<b>125</b>
9.1 Economic problem	125
9.2 Modelling	128
9.3 Analysis, simulation and visualisation	131
9.4 Concluding remarks, extensions and challenges	140
<b>CHAPTER 10 AN ENDOGENOUS GROWTH MODEL</b>	<b>143</b>
10.1 Economic problem	143
10.2 Modelling	146
10.3 Analysis, simulation and visualisation	148
10.3.1 Stability analysis	150
10.3.2 Simulation analysis and visualisation	151
10.3.3 Discussion	155
10.4 Concluding remarks, extensions and challenges	156

<b>CHAPTER 11 BUSINESS CYCLES I: SAMUELSON'S MULTIPLIER-ACCELERATOR MODEL</b>	<b>161</b>
11.1 Modelling	163
11.2 Analysis, simulation and visualisation	164
11.3 Concluding remarks, extensions and challenges	170
<b>CHAPTER 12 BUSINESS CYCLES II: THE REAL BUSINESS CYCLE MODEL</b>	<b>173</b>
12.1 Economic problem	173
12.2 Modelling	174
12.3 Analysis and visualisation	181
12.3.1 Solution method	183
12.3.2 Equilibrium solution: The optimal path	185
12.3.3 Optimal paths under parameter variations	186
12.3.4 Optimal paths for stochastic variations in parameters	187
12.4 Concluding remarks, extensions and challenges	189
<b>APPENDIX A DIFFERENCE AND DIFFERENTIAL EQUATIONS</b>	<b>193</b>
A.1 First-order linear difference equation	193
A.2 Second-order linear difference equation	194
A.3 First-order linear differential equations	196
A.4 Second-order linear differential equations	198
A.5 Systems of linear first-order differential equations	199
<b>APPENDIX B MATLAB® CODES</b>	<b>201</b>
B.1 Chapter 1	201
B.2 Chapter 2	203
B.3 Chapter 3	205
B.4 Chapter 4	207
B.5 Chapter 5	208
B.6 Chapter 6	211
B.7 Chapter 7	213
B.8 Chapter 8	216
B.9 Chapter 9	219
B.10 Chapter 10	221
B.11 Chapter 11	224
B.12 Chapter 12	226
Index	233