Macroeconomics
Institutions, Instability, and the Financial System

Wendy Carlin
David Soskice

OXFORD UNIVERSITY PRESS
## Contents

Reviews ii
Preface ix
How to use the Online Resource Centre xviii
Acknowledgements xx
List of figures xxxi
List of tables xxxviii
Abbreviations xxxix

### 1 The demand side

1.1 Overview 1
   1.1.1 Facts about the demand side and business cycles 3
   1.1.2 Introducing the IS curve 7
1.2 Modelling 11
   1.2.1 Goods market equilibrium 11
   1.2.2 The multiplier 13
   1.2.3 The IS curve 16
   1.2.4 Forward-looking behaviour 19
   1.2.5 Consumption 20
   1.2.6 Investment 29
   1.2.7 Consumption, investment and the IS curve 32
1.3 Conclusions 34
1.4 Appendix 36
   1.4.1 Real and nominal interest rates and the Fisher equation 36
   1.4.2 Deriving the Euler equation and the PIH consumption function 37
1.5 Questions 39
   1.5.1 Checklist questions 39
   1.5.2 Problems and questions for discussion 40

### 2 The supply side

2.1 Overview 42
   2.1.1 Unemployment 42
   2.1.2 Why the labour market does not clear 42
   2.1.3 Supply side effects on unemployment 45
   2.1.4 Nominal rigidities and demand-side policy 48
   2.1.5 Facts about the supply side 51
2.2 Modelling 55
   2.2.1 Supply side effects on unemployment 56
   2.2.2 Nominal rigidities, inflation and the business cycle 63
2.3 Applications 70
2.4 Conclusions 72
2.5 Appendix 74
## CONTENTS

2.5.1 The textbook model: competitive markets and complete contracts 74
2.5.2 The mark-up and the elasticity of demand 75
2.5.3 Deriving the PS curve including the tax wedge 77

2.6 Questions 77
2.6.1 Checklist questions 77
2.6.2 Problems and questions for discussion 78

### 3 The 3-equation model and macroeconomic policy 80

3.1 Overview 80
3.1.1 The role of the central bank in stabilization 83
3.1.2 Inflation and deflation 85
3.1.3 Introduction to the 3-equation model 89

3.2 Modelling 92
3.2.1 The 3-equation model 92
3.2.2 Using the 3-equation model 98

3.3 Applications 100
3.3.1 A temporary demand shock 100
3.3.2 Forecasting and lags 102
3.3.3 The deflation trap 104
3.3.4 A supply shock 107

3.4 Conclusions 109
3.5 Appendix 111
3.5.1 The 3-equation model in more detail 111

3.6 Questions 113
3.6.1 Checklist questions 113
3.6.2 Problems and questions for discussion 114

### 4 Expectations 116

4.1 Introduction 116
4.2 Risk, uncertainty and expectations 118
4.2.1 Risk and uncertainty 118
4.2.2 Expectations formation in real-world situations 122
4.2.3 The rational expectations hypothesis (REH) 123

4.3 Phillips curves, expectations and inflation 124
4.4 Expectations and the 3-equation model 130
4.4.1 A graphical example 130
4.4.2 Comparison of adaptive and rational inflation expectations 130
4.4.3 Central bank communication and anchoring inflation expectations 133

4.5 The Lucas critique 136
4.6 Expectations hypotheses, inflation bias and time inconsistency 138
4.6.1 Adaptive expectations and inflation bias 139
4.6.2 Rational expectations, inflation bias and time inconsistency 141
4.6.3 Approaches to mitigate inflation bias 142

4.7 Conclusions 144
4.8 Questions 146
4.8.1 Checklist questions 146
4.8.2 Problems and questions for discussion 147

### 5 Money, banking and the macro-economy 149

5.1 Introduction 149
## CONTENTS

7.2.2 Instruments 226
7.2.3 Actors 229
7.3 The upswing of the financial cycle 232
7.4 The crisis
  7.4.1 The scale of the crisis and nature of the post-crisis recession 236
  7.4.2 The credit crunch 239
  7.4.3 The crisis, macroeconomic policy and the 3-equation model 242
7.5 Policy intervention in the crisis
  7.5.1 What went wrong in the Great Depression? 246
  7.5.2 Monetary and fiscal policy in the crisis phase 247
  7.5.3 Austerity policies in the post-crisis recession 254
  7.5.4 Fixing banks first may mean less government debt later 257
7.6 Conclusions 259
7.7 Questions
  7.7.1 Checklist questions 260
  7.7.2 Problems and questions for discussion 261

8 Growth, fluctuations and innovation 262
8.1 Introduction 262
8.2 Short- and medium-run macro models and growth theory 267
8.3 Growth concepts and useful tools 270
8.4 The Solow model
  8.4.1 The model 274
  8.4.2 Steady state or balanced growth 276
8.5 The Solow model and cross-country performance 282
8.6 Technological progress in the Solow model
  8.6.1 Technological progress and steady state growth 288
  8.6.2 Growth accounting: measuring the impact of technology 290
8.7 Endogenous growth: the Romer model
  8.7.1 Research and development 292
  8.7.2 Endogenous growth and endogenous technological progress: the Romer model 293
8.8 Schumpeterian growth: the Aghion-Howitt model
  8.8.1 Creative destruction, competition and Schumpeterian growth 298
  8.8.2 Schumpeterian growth and business cycle fluctuations 300
8.9 Conclusions 302
8.10 Questions
  8.10.1 Checklist questions 302
  8.10.2 Problems and questions for discussion 303

9 The 3-equation model in the open economy 305
9.1 Overview 305
9.2 Modeling
  9.2.1 The foreign exchange market and the UIP condition 316
  9.2.2 Medium-run equilibrium in the open economy and the AD-ERU model 319
  9.2.3 AD curve 321
  9.2.4 Stabilization under flexible exchange rates: 3-equation model and RX curve 323
  9.2.5 Inflation shock: Comparing closed and open economies 325
9.3 Applications
  9.3.1 Demand and supply shocks: the 3-equation and AD-ERU models 330
9.3.2 Exchange rate overshooting 333
9.3.3 Exchange rate volatility 338
9.4 Conclusions 339
9.5 Appendix 340
  9.5.1 Deriving the real $\text{UIP}$ condition 340
  9.5.2 The 3-equation model in more detail 341
  9.5.3 Derivation of $(1 - \lambda)$ and its properties 345
  9.5.4 Geometry of the $\text{RX}$ curve: varying the parameters 346
9.6 Questions 347
  9.6.1 Checklist questions 347
  9.6.2 Problems and questions for discussion 348

10 The open economy: the demand and supply sides 350
  10.1 Overview 350
    10.1.1 The open economy accounting framework 351
    10.1.2 The demand side, trade balance and the supply side 353
  10.2 Modelling 357
    10.2.1 The demand side and trade balance 357
    10.2.2 The supply side in the open economy 366
    10.2.3 The medium-run model: $\text{AD-BT-ERU}$ 371
  10.3 Application 379
    10.3.1 The UK economy before the crisis 379
  10.4 Conclusions 384
  10.5 Appendix 385
  10.6 Questions 386
    10.6.1 Checklist questions 386
    10.6.2 Problems and questions for discussion 387

11 Extending the open economy model: oil shocks and imbalances 389
  11.1 Overview 389
    11.1.1 How does a commodity price rise affect the macro-economy? 390
    11.1.2 Interpreting an economy’s sector financial balances: does a current account imbalance matter? 394
    11.1.3 Inflation targeting in a two-bloc world 395
    11.1.4 Different medium-run ‘growth’ strategies can cause global imbalances 396
  11.2 Modelling 399
    11.2.1 Oil shocks 399
    11.2.2 Current account imbalances 405
    11.2.3 Sector financial balances 410
    11.2.4 Global interdependence and imbalances 413
    11.2.5 A 2-bloc model with inflation-targeting central banks 414
  11.3 Conclusions 421
  11.4 Appendix 422
    11.4.1 Dynamic adjustment to a shock in the 2-bloc model 422
  11.5 Questions 425
    11.5.1 Checklist questions 425
    11.5.2 Problems and questions for discussion 426

12 The Eurozone 428
  12.1 Introduction 428
    12.1.1 Origins of the Eurozone and the theory of an optimal currency area 430
CONTENTS

12.1.2 The Eurozone's performance in its first ten years 432
12.2 The Eurozone policy regime 435
12.2.1 The Maastricht policy assignment 435
12.2.2 Monetary policy in the Eurozone 436
12.2.3 Fiscal policy in the Eurozone 437
12.3 Stabilization in the Eurozone: common shocks 439
12.4 Stabilization in the Eurozone: country-specific shocks 440
12.4.1 Is stabilization policy necessary for country-specific shocks? 440
12.4.2 The real exchange rate (competitiveness) channel 442
12.4.3 The real interest rate channel 443
12.4.4 Using fiscal policy to stabilize 444
12.4.5 The real exchange rate channel—internal devaluation 448
12.4.6 Conclusions about stabilization policy in the Eurozone 450
12.5 Eurozone governance, sovereign risk and the banking system 451
12.5.1 Governance arrangements: banks, governments and central bank 453
12.5.2 Governance solutions 460
12.6 Conclusions 463
12.7 Questions 464
12.7.1 Checklist questions 464
12.7.2 Problems and questions for discussion 465

13 Monetary policy 467
13.1 Introduction 467
13.2 Monetary policy and the economy's nominal anchor 468
13.2.1 The classical dichotomy and the nominal anchor 468
13.2.2 From theory to practice: monetary policy and inflation in the 1970s and 1980s 469
13.2.3 The inflation target as the nominal anchor 473
13.3 Modelling 473
13.3.1 Active rule-based policy 473
13.3.2 Central bank preferences: sacrifice ratios and costly disinflation 473
13.3.3 The MR equation and Taylor rules 476
13.4 The modern monetary policy framework—practice 478
13.4.1 Taylor rules in practice 480
13.5 Monetary policy and the global financial crisis 483
13.5.1 Asset price bubbles and central bank intervention 483
13.5.2 Unorthodox monetary policy in the Great Recession 484
13.6 Post-crisis reform of financial regulation and the macro policy framework 493
13.6.1 The failures of the conventional macroeconomic policy framework 493
13.6.2 Post-crisis reforms for a safer financial system 495
13.7 Conclusions 501
13.8 Questions 503
13.8.1 Checklist questions 503
13.8.2 Problems and questions for discussion 504

14 Fiscal policy 505
14.1 Introduction 505
14.2 Fiscal policy's role in stabilization 506
14.2.1 The scope of fiscal policy 506
14.2.2 The effects of discretionary fiscal policy 507
14.2.3 The automatic stabilizers 513
14.3 Debt dynamics
   14.3.1 The government’s budget identity 516
   14.3.2 Debt dynamics 518
   14.3.3 The costs of high and rising government debt 525
   14.3.4 Can fiscal consolidation be expansionary? 528
14.4 The government’s budget constraint and Ricardian equivalence 530
   14.4.1 Ricardian equivalence and the PIH 531
   14.4.2 Ricardian equivalence and fiscal policy effectiveness 534
14.5 Deficit bias and the political economy of debt 535
   14.5.1 Causes of deficit bias 536
   14.5.2 Why deficit bias may vary across countries 536
   14.5.3 Approaches to tackle deficit bias 537
14.6 Conclusions 541
14.7 Questions 542
   14.7.1 Checklist questions 542
   14.7.2 Problems and questions for discussion 543

15 Supply-side policy, institutions and unemployment 546
   15.1 Introduction 546
   15.2 Flows, matching and the Beveridge curve 549
   15.3 Unions and wage-setting arrangements 554
   15.4 Efficiency wage models
       15.4.1 A micro model of efficiency wage setting 558
       15.4.2 What is the empirical evidence on efficiency wages? 562
   15.5 Hysteresis and persistence in unemployment 564
   15.6 Unemployment in OECD countries
       15.6.1 Definitions: employment, unemployment and inactivity 568
       15.6.2 Overview 569
       15.6.3 Empirical studies 571
   15.7 Labour market behaviour in the crisis
       15.7.1 US unemployment during the crisis 575
       15.7.2 European unemployment during the crisis 576
   15.8 Conclusions 579
   15.9 Questions
       15.9.1 Checklist questions 580
       15.9.2 Problems and questions for discussion 581

16 Real Business Cycle and New Keynesian models 583
   16.1 Introduction 583
   16.2 The real business cycle model
       16.2.1 Introduction 585
       16.2.2 The RBC model and business cycle facts 586
       16.2.3 The model and its properties 588
       16.2.4 Results 593
       16.2.5 Criticisms of the RBC model 596
       16.2.6 The impact of RBC modelling 599
   16.3 The New Keynesian model and stabilization policy
       16.3.1 The New Keynesian Phillips curve 600
       16.3.2 Stabilization bias 604
       16.3.3 NK DSGE modelling 606