THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS

FIFTH CANADIAN EDITION

FREDERIC S. MISHKIN
APOSTOLOS SERLETIS

CDN$ 1.1890 / 1.1893

THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS

FIFTH CANADIAN EDITION

This page intentionally left blank

THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS

FIFTH CANADIAN EDITION

FREDERIC S. MISHKIN
COLUMBIA UNIVERSITY

APOSTOLOS SERLETIS
UNIVERSITY OF CALGARY

PEARSON
Toronto

Vice-President, Editorial Director: Gary Bennett
Editor-in-Chief: Nicole Lukach
Acquisitions Editor: Claudine O'Donnell
Sponsoring Editor: Jen Parks
Marketing Manager: Leigh-Anne Graham
Supervising Developmental Editor: Madhu Ranadive
Developmental Editor: Rebecca Ryoji
Project Manager: Sarah Lukaweski
Manufacturing Coordinator: Jane Schell
Production Editor: Carrie Fox
Copy Editor: Susan Bindernagel
Proofreader: Stephanie Fysh
Project Coordination and Editorial Services: Electronic Publishing Services Inc., NYC
Electronic Page Makeup: Jouve
Permissions Researcher: Tom Wilcox, PreMediaGlobal
Art Director: Julia Hall
Cover Designer: Anthony Leung
Interior Designer: Anthony Leung
Cover Image: Masterfile

Credits and acknowledgments for material borrowed from other sources and reproduced, with permission, in this textbook appear on the appropriate page within the text.

Original edition published by Pearson Education, Inc., Upper Saddle River, New Jersey, USA. Copyright © 2012 Pearson Education, Inc. This edition is authorized for sale only in Canada.

If you purchased this book outside the United States or Canada, you should be aware that it has been imported without the approval of the publisher or the author.

Copyright © 2014 Pearson Canada Inc. All rights reserved. Manufactured in the United States of America. This publication is protected by copyright and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. To obtain permission(s) to use material from this work, please submit a written request to Pearson Canada Inc., Permissions Department, 26 Prince Andrew Place, Don Mills, Ontario, M3C 2T8, or fax your request to 416-447-3126, or submit a request to Permissions Requests at **www.pearsoncanada.ca**.

10 9 8 7 6 5 4 3 2 1 [EB]

Library and Archives Canada Cataloguing in Publication
Mishkin, Frederic S.
The economics of money, banking and financial markets / Frederic S. Mishkin, Apostolos Serletis.
— 5th Canadian ed.

Includes bibliographical references and index.
ISBN 978-0-321-78570-1

1. Finance—Textbooks. 2. Money—Textbooks. 3. Banks and banking—Textbooks.
I. Serletis, Apostolos, 1954- II. Title.

HG173.M58 2013 332 C2012-905239-6

PEARSON

9780321785701

Brief Contents

PART 1 Introduction 1

Chapter 1 Why Study Money, Banking, and Financial Markets? 2

Chapter 2 An Overview of the Financial System 21

Chapter 3 What Is Money? 46

PART 2 Financial Markets 60

Chapter 4 Understanding Interest Rates 61

Chapter 5 The Behaviour of Interest Rates 84

Chapter 6 The Risk and Term Structure of Interest Rates 112

Chapter 7 The Stock Market, the Theory of Rational Expectations, and the Efficient Market Hypothesis 137

PART 3 Financial Institutions 158

Chapter 8 An Economic Analysis of Financial Structure 160

Chapter 9 Financial Crises 181

Chapter 10 Economic Analysis of Financial Regulation 210

Chapter 11 Banking Industry: Structure and Competition 237

Chapter 12 Nonbank Finance 270

PART 4 The Management of Financial Institutions 292

Chapter 13 Banking and the Management of Financial Institutions 293

Chapter 14 Risk Management with Financial Derivatives 323

PART 5 Central Banking and the Conduct of Monetary Policy 351

Chapter 15 Central Banks and the Bank of Canada 353

Chapter 16 The Money Supply Process 375

Chapter 17 Tools of Monetary Policy 403

Chapter 18 The Conduct of Monetary Policy: Strategy and Tactics 438

PART 6 International Finance and Monetary Policy 469

Chapter 19 The Foreign Exchange Market 470

Chapter 20 The International Financial System 492

PART 7 Monetary Theory 523

Chapter 21 Quantity Theory, Inflation, and the Demand for Money 525

Chapter 22 The *IS* Curve 541

Chapter 23 The Monetary Policy and Aggregate Demand Curves 558

Chapter 24 Aggregate Demand and Supply Analysis 571

Chapter 25 Monetary Policy Theory 602

Chapter 26 The Role of Expectations in Monetary Policy 619

Chapter 27 Transmission Mechanisms of Monetary Policy 637

This page intentionally left blank

Contents

Preface xxiii

About the Authors xxxii

PART 1 Introduction 1

CHAPTER 1
Why Study Money, Banking, and Financial Markets? 2

Preview 2

Why Study Financial Markets? 2
- The Bond Market and Interest Rates 3
- The Stock Market 3

Why Study Financial Institutions and Banking? 5
- Structure of the Financial System 5
- Financial Crises 5
- Banks and Other Financial Institutions 6
- Financial Innovation 6

Why Study Money and Monetary Policy? 6
- Money and Business Cycles 7
- Money and Inflation 7
- Money and Interest Rates 8
- Conduct of Monetary Policy 10
- Fiscal Policy and Monetary Policy 10

Why Study International Finance? 11
- The Foreign Exchange Market 11
- The International Financial System 12

How We Will Study Money, Banking, and Financial Markets 12
- Exploring the Web 13
- Collecting and Graphing Data 13
- Sample Web Exercise 14

Concluding Remarks 14

Summary 15

Key Terms 16

Questions 16

Applied Problems 17

Web Exercises 17

APPENDIX TO CHAPTER 1
Defining Aggregate Output, Income, the Price Level, and the Inflation Rate 18

Aggregate Output and Income 18

Real Versus Nominal Magnitudes 18

Aggregate Price Level 19

Growth Rates and the Inflation Rate 19

CHAPTER 2
An Overview of the Financial System 21

Preview 21

Function of Financial Markets 22

Structure of Financial Markets 23
- Debt and Equity Markets 24
- Primary and Secondary Markets 24
- Exchanges and Over-the-Counter Markets 25
- Money and Capital Markets 25

Financial Market Instruments 25
- Money Market Instruments 26

Financial News Money Market Rates 28
- Capital Market Instruments 28

Internationalization of Financial Markets 30
- International Bond Market, Eurobonds, and Eurocurrencies 30

Global Are U.S. Capital Markets Losing Their Edge? 31

Financial News Foreign Stock Market Indexes 32
- World Stock Markets 32

Function of Financial Intermediaries: Indirect Finance 32

Global The Importance of Financial Intermediaries Relative to Securities Markets: An International Comparison 33
- Transaction Costs 33
- Risk Sharing 34

Asymmetric Information: Adverse Selection and Moral Hazard 34
Economies of Scope and Conflicts of Interest 36

Types of Financial Intermediaries 36
Depository Institutions (Banks) 37
Contractual Savings Institutions 38
Investment Intermediaries 39

Regulation of the Financial System 39
Increasing Information Available to Investors 40
Ensuring the Soundness of Financial Intermediaries 41
Financial Regulation Abroad 42

Summary 42
Key Terms 43
Questions 44
Applied Problems 44
Web Exercises 45

CHAPTER 3

What Is Money? 46

Preview 46
Meaning of Money 46
Functions of Money 47
Medium of Exchange 47
Unit of Account 48

FYI Money in a Prisoner-of-War Camp and Modern Prisons 48
Store of Value 49

Evolution of the Payments System 50
Commodity Money 50
Fiat Money 50
Cheques 51
Electronic Payment 51
E-Money 51

FYI Are We Headed for a Cashless Society? 52

Measuring Money 53
The Bank of Canada's Monetary Aggregates 53

FYI Where Are All the Dollars? 56
Money as a Weighted Aggregate 57

Summary 57
Key Terms 58
Questions 58
Applied Problems 59
Web Exercises 59

PART 2 **Financial Markets 60**

CHAPTER 4

Understanding Interest Rates 61

Preview 61
Measuring Interest Rates 62
Present Value 62

Application How to Use Your Financial Calculator 63
Application Simple Present Value 64
Application How Much Is That Jackpot Worth? 64
Four Types of Credit Market Instruments 65
Yield to Maturity 66

Application Yield to Maturity on a Simple Loan 66
Application Yield to Maturity on a Fixed-Payment Loan 68
Application Yield to Maturity for a Coupon Bond 69
Application Yield to Maturity on a Perpetuity 72
Global Negative T-Bill Rates? It Can Happen 73

The Distinction Between Interest Rates and Returns 74

Application Calculating the Rate of Return 74
Application Calculating the Rate of Capital Gain 75
Maturity and the Volatility of Bond Returns: Interest-Rate Risk 77
Summary 78

The Distinction Between Real and Nominal Interest Rates 78

Application Calculating Real Interest Rates 79
FYI With Real Return Bonds, Real Interest Rates Have Become Observable in Canada 81
Application Calculating the Principal and Coupon Payment of Real Return Bonds 81

Summary 82
Key Terms 82
Questions 82
Applied Problems 83
Web Exercises 83

CHAPTER 5

The Behaviour of Interest Rates. 84

Preview 84
Determinants of Asset Demand 85
Wealth 85
Expected Return 85
Risk 85
Liquidity 86
Theory of Portfolio Choice 86
Supply and Demand in the Bond Market 87
Demand Curve 87
Supply Curve 88
Market Equilibrium 89
Supply and Demand Analysis 89
Changes in Equilibrium Interest Rates 90
Shifts in the Demand for Bonds 90
Shifts in the Supply of Bonds 93
Application Changes in the Interest Rate Due to Expected Inflation: The Fisher Effect 95
Application Changes in the Interest Rate Due to a Business Cycle Expansion 97
Application Explaining Low Japanese Interest Rates 98
Supply and Demand in the Market for Money: The Liquidity Preference Framework 99
Changes in Equilibrium Interest Rates 101
Shifts in the Demand for Money 101
Shifts in the Supply of Money 102
Application Changes in the Equilibrium Interest Rate Due to Changes in Income, the Price Level, or the Money Supply 102
Application Money and Interest Rates 104
Does a Higher Rate of Growth of the Money Supply Lower Interest Rates? 105
Summary 108
Key Terms 109
Questions 109
Applied Problems 110
Web Exercises 111

CHAPTER 6

The Risk and Term Structure of Interest Rates 112

Preview 112
Risk Structure of Interest Rates 112
Default Risk 113
FYI Conflicts of Interest at Credit-Rating Agencies and the Global Financial Crisis 116
Application The Global Financial Crisis and the BBB-Treasury Spread in the United States 116
Liquidity 116
Income Tax Considerations 117
Application Tax-Exempt Versus Taxable Bonds 117
Summary 118
Term Structure of Interest Rates 118
Financial News Yield Curves 119
Expectations Theory 120
Application Expectations Theory 120
Application Expectations Theory and the Yield Curve 122
Segmented Markets Theory 123
Liquidity Premium and Preferred Habitat Theories 124
Application Liquidity Premium Theory 126
The Predictive Power of the Yield Curve 127
Summary 128
FYI The Yield Curve as a Forecasting Tool for Inflation and the Business Cycle 129
Application Interpreting Yield Curves, 1990–2012 129
Application Using the Term Structure to Forecast Interest Rates 130
Application Forward Rate 132
Summary 133
Key Terms 133
Questions 134
Applied Problems 135
Web Exercises 136

CHAPTER 7

The Stock Market, the Theory of Rational Expectations, and the Efficient Market Hypothesis 137

Preview 137
Computing the Price of Common Stock 138
The One-Period Valuation Model 138
The Generalized Dividend Valuation Model 138
Application Stock Valuation 139
The Gordon Growth Model 140

Application Stock Valuation, Constant Growth 140
Price-Earnings Valuation Method 141
Application Stock Valuation, PE Ratio Approach 141
How the Market Sets Stock Prices 142
Application Monetary Policy and Stock Prices 143
Application The Global Financial Crisis and the Stock Market 143
The Theory of Rational Expectations 144
Formal Statement of the Theory 145
Rationale Behind the Theory 145
Implications of the Theory 146
The Efficient Market Hypothesis: Rational Expectations in Financial Markets 147
Application The Efficient Market Hypothesis 148
Rationale Behind the Theory 149
Application Practical Guide to Investing in the Stock Market 150
FYI Should You Hire an Ape as Your Investment Adviser? 152
Why the Efficient Market Hypothesis Does Not Imply That Financial Markets Are Efficient 152
Application What Do Stock Market Crashes Tell Us About the Efficient Market Hypothesis and the Efficiency of Financial Markets? 153
Behavioural Finance 154
Summary 155
Key Terms 155
Questions 156
Applied Problems 156
Web Exercises 157

PART 3 **Financial Institutions 158**

CHAPTER 8
An Economic Analysis of Financial Structure 160
Preview 160
Basic Facts About Financial Structure Throughout the World 160
Transaction Costs 163
How Transaction Costs Influence Financial Structure 163
How Financial Intermediaries Reduce Transaction Costs 164
Asymmetric Information: Adverse Selection and Moral Hazard 164
The Lemons Problem: How Adverse Selection Influences Financial Structure 165
Lemons in the Stock and Bond Markets 166
Tools to Help Solve Adverse Selection Problems 166
FYI The Enron Implosion 168
Summary 170
How Moral Hazard Affects the Choice Between Debt and Equity Contracts 170
Moral Hazard in Equity Contracts: The Principal–Agent Problem 171
Tools to Help Solve the Principal–Agent Problem 171
How Moral Hazard Influences Financial Structure in Debt Markets 173
Tools to Help Solve Moral Hazard in Debt Contracts 173
Summary 175
Application Financial Development and Economic Growth 176
Application Is China a Counter-Example to the Importance of Financial Development? 178
Summary 179
Key Terms 179
Questions 179
Applied Problems 180
Web Exercises 180

CHAPTER 9
Financial Crises 181
Preview 181
What Is a Financial Crisis? 182
Dynamics of Financial Crises in Advanced Economies 182
Stage One: Initiation of Financial Crisis 182
Stage Two: Banking Crisis 184
Stage Three: Debt Deflation 185
Application The Mother of All Financial Crises: The Great Depression in the United States 185
Application The Global Financial Crisis of 2007–2009 188
FYI The Process of Securitization 188

FYI Collateralized Debt Obligations (CDOs). . . 190

Global Ireland and the 2007–2009 Financial Crisis . . . 193

Global The Greek Sovereign Debt Crisis . . . 194

Global Worldwide Government Bailouts During the 2007–2009 Financial Crisis . . . 196

Application Canada and the 2007–2009 Financial Crisis . . . 196

FYI Canada's Asset-Backed Commercial Paper Crisis . . . 197

Dynamics of Financial Crises in Emerging Market Economies . . . 199
- Stage One: Initiation of Financial Crisis . . . 199
- Stage Two: Currency Crisis . . . 202
- Stage Three: Full-Fledged Financial Crisis . . . 203

Application Financial Crises in Mexico, 1994–1995; East Asia, 1997–1998; and Argentina, 2001–2002 . . . 204

Summary . . . 207

Key Terms . . . 208

Questions . . . 208

Web Exercises . . . 209

CHAPTER 10

Economic Analysis of Financial Regulation . . . 210

Preview . . . 210

Asymmetric Information and Financial Regulation . . . 210
- Government Safety Net . . . 211

Global The Spread of Government Deposit Insurance Throughout the World: Is This a Good Thing? . . . 212
- Restrictions on Asset Holdings . . . 214
- Capital Requirements . . . 215
- Prompt Corrective Action . . . 215
- Financial Supervision: Chartering and Examination . . . 216

Global Where Is the Basel Accord Heading After the Global Financial Crisis? . . . 217
- Assessment of Risk Management . . . 218
- Disclosure Requirements . . . 218
- Consumer Protection . . . 219
- Restrictions on Competition . . . 219
- Macroprudential Versus Microprudential Supervision . . . 220
- Summary . . . 221

FYI Mark-to-Market Accounting and the Global Financial Crisis . . . 221

FYI The Subprime Mortgage Crisis and Consumer Protection Regulation . . . 222

The 1980s Canadian Banking Crisis . . . 224
- Early Stage of the Crisis . . . 225

Global International Financial Regulation . . . 225
- Later Stage of the Crisis: Regulatory Forbearance . . . 226

CDIC Developments . . . 227
- Differential Premiums . . . 227
- Opting Out . . . 228

Application Evaluating CDIC and Other Proposed Reforms of the Banking Regulatory System . . . 229

Banking Crises Throughout the World . . . 231
- "Déjà Vu All Over Again" . . . 231

The Global Financial Crisis and Future Regulation . . . 233

Summary . . . 234

Key Terms . . . 235

Questions . . . 235

Applied Problems . . . 236

Web Exercises . . . 236

CHAPTER 11

Banking Industry: Structure and Competition . . . 237

Preview . . . 237

Historical Development of the Canadian Banking System . . . 238
- The Free Banking Experiment . . . 239

FYI The Dual Banking System in the United States . . . 239
- The Provincial Notes Act, 1866 . . . 240
- The Dominion Notes Act, 1870 . . . 240
- The First Bank Act, 1871 . . . 241
- The Bank Act, 1881–1913 . . . 241
- The Finance Act, 1914 . . . 242

Financial Innovation and the Growth of the "Shadow Banking System" . . . 242
- Responses to Changes in Demand Conditions: Interest-Rate Volatility . . . 243
- Responses to Changes in Supply Conditions: Information Technology . . . 244

Global Will "Clicks" Dominate "Bricks" in the Banking Industry? . . . 246
- Avoidance of Existing Regulations . . . 247

FYI Bruce Bent and the Money Market Mutual Fund Panic of 2008 . . . 249

Financial Innovation and the Decline of Traditional Banking 250

Structure of the Canadian Chartered Banking Industry 251

Schedule I, Schedule II, and Schedule III Banks 252

Competition and Technology 253

Comparison with the United States 253

Response to Branching Restrictions in the United States 255

Competition Across All Four Pillars 255

Convergence 255

Implications for Financial Consolidation 256

FYI The Subprime Financial Crisis and the Demise of Large, Free-Standing Investment Banks 257

Separation of Banking and Other Financial Services Industries Throughout the World 257

The Near Banks: Regulation and Structure 258

Trust Companies 258

Loan Companies 258

Cooperatives: Credit Unions and *Caisses Populaires* 259

Government Savings Institutions 260

International Banking 260

Eurocurrencies Market 261

Global Ironic Birth of the Eurodollar Market 261

Canadian Banking Overseas 262

Foreign Banks in Canada 262

The 2001 Bank Act Reform 263

Bank Holding Companies 264

Permitted Investments 265

Ownership Rules 265

The CP Act and Access to the Payments and Clearance System 265

Merger Review Policy 266

The National Financial Services OmbudService 266

Implications for the Canadian Banking Industry 267

Summary 267

Key Terms 268

Questions 268

Web Exercises 269

Web References 269

CHAPTER 12

Nonbank Finance 270

Preview 270

Insurance 270

Life Insurance 271

Property and Casualty Insurance 272

Credit Insurance 273

FYI Credit Default Swaps on Greek Sovereign Debt 274

FYI The AIG Blowup 274

The New Legislative Framework 274

Application Insurance Management 275

Pension Funds 278

Public Pension Plans 279

Private Pension Plans 279

FYI Should Public Pension Plans Be Privatized? 280

Personal Pension Plans 280

Finance Companies 281

Securities Market Operations 281

Investment Banking 282

Securities Brokers and Dealers 283

Organized Exchanges 283

Mutual Funds 283

FYI Sovereign Wealth Funds: Are They a Danger? 285

Money Market Mutual Funds 285

Hedge Funds 285

FYI The Long-Term Capital Management Debacle 286

Private Equity and Venture Capital Funds 287

Government Financial Intermediation 288

Crown Finance Companies 288

Government-Sponsored Enterprises in the United States 288

FYI The Subprime Financial Crisis and the Bailout of Fannie Mae and Freddie Mac 289

Summary 290

Key Terms 290

Questions 291

Web Exercises 291

PART 4 **The Management of Financial Institutions 292**

CHAPTER 13

Banking and the Management of Financial Institutions 293

Preview 293

The Bank Balance Sheet. 294
Liabilities 294
Assets 296
Basic Banking 297
General Principles of Bank Management 300
Liquidity Management and the Role of Reserves 300
Asset Management 303
Liability Management 304
Capital Adequacy Management 304
Application Strategies for Managing Bank Capital 307
Application How a Capital Crunch Caused a Credit Crunch During the Global Financial Crisis. 307
Managing Credit Risk 308
Screening and Monitoring. 308
Long-Term Customer Relationships 309
Loan Commitments 310
Collateral and Compensating Balances 310
Credit Rationing. 311
Managing Interest-Rate Risk. 311
Gap Analysis 312
Application Gap Analysis 313
Duration Analysis 313
Application Duration Analysis 314
Application Duration Gap Analysis 315
Application Strategies for Managing Interest-Rate Risk. 316
Off-Balance-Sheet Activities. 317
Loan Sales. 317
Generation of Fee Income 317
Trading Activities and Risk-Management Techniques 318
Global Barings, Daiwa, Sumitomo, and Société Générale: Rogue Traders and the Principal–Agent Problem 319
Summary. 320
Key Terms 320
Questions 321
Applied Problems 321
Web Exercises. 322

CHAPTER 14
Risk Management with Financial Derivatives 323
Preview 323
Hedging 323
Forward Contracts and Markets 324
Interest-Rate Forward Contracts 324
Application Hedging with Interest-Rate Forward Contracts. 324
Pros and Cons of Forward Contracts 325
Financial Futures Contracts and Markets 326
Interest-Rate Futures Contracts. 326
Application Hedging with Interest-Rate Futures 327
Organization of Trading in Financial Futures Markets. 328
The Globalization of Financial Futures Markets. 329
Explaining the Success of Futures Markets. 330
Application Hedging Foreign Exchange Risk. 331
Stock Index Futures 333
Stock Index Futures Contracts. 333
Application Hedging with Stock Index Futures 333
Options. 334
Stock Options 335
Futures Options. 337
Application Hedging with Futures Options. 340
Factors Affecting the Prices of Option Premiums 341
Summary. 342
Swaps. 342
Interest-Rate Swap Contracts. 343
Application Hedging with Interest-Rate Swaps. 343
Advantages of Interest-Rate Swaps 344
Disadvantages of Interest-Rate Swaps. 344
Financial Intermediaries in Interest-Rate Swaps 345
Credit Derivatives 345
Credit Options. 345
Credit Swaps 346
Credit-Linked Notes 346
Application Lessons from the Global Financial Crisis: When Are Financial Derivatives Likely to Be a Worldwide Time Bomb?. 347
Summary. 348
Key Terms 349
Questions 349

Applied Problems 349
Web Exercises. 350

PART 5 Central Banking and the Conduct of Monetary Policy 351

CHAPTER 15
Central Banks and the Bank of Canada 353
Preview 353
Origins of the Bank of Canada. 354
Global Establishment of Selected Central Banks 354
Formal Structure of the Bank of Canada. 355
The Functions of the Bank of Canada 355
Inside the Central Bank The Political Environment and the Bank of Canada 355
Currency 356
Funds Management. 356
Financial System 356
Monetary Policy. 357
Inside the Central Bank Role of the Bank's Research Staff 358
How Independent Is the Bank of Canada?. 358
The Changing Face of the Bank of Canada 360
From Opaqueness to Accountability and Transparency 362
Should the Bank of Canada Be Independent? 362
The Case for Independence 363
FYI Economics and Politics. 363
The Case Against Independence 364
Global Central Bank Independence and Macroeconomic Performance 365
Explaining Central Bank Behaviour 365
Structure and Independence of Foreign Central Banks 366
Inside the Central Bank The Special Role of the Federal Reserve Bank of New York 368
European Central Bank. 369
Bank of England 371
Bank of Japan. 372
The Trend Toward Greater Independence. 372
Summary. 373
Key Terms 373
Questions. 374
Web Exercises. 374
Web References 374

CHAPTER 16
The Money Supply Process 375
Preview 375
Three Players in the Money Supply Process. 375
The Bank of Canada's Balance Sheet 376
Liabilities 376
Assets 377
Control of the Monetary Base 377
Bank of Canada Open Market Operations 378
Shifts from Deposits into Currency. 381
Loans to Financial Institutions. 382
Other Factors That Affect the Monetary Base 382
Overview of the Bank of Canada's Ability to Control the Monetary Base 383
Multiple Deposit Creation: A Simple Model 383
Deposit Creation: The Single Bank 384
Deposit Creation: The Banking System 385
Deriving the Formula for Multiple Deposit Creation 387
Critique of the Simple Model 389
Factors That Determine the Money Supply 389
Changes in the Nonborrowed Monetary Base, MB_n 390
Changes in Borrowed Reserves, *BR*, from the Bank of Canada 390
Changes in the Desired Reserve Ratio, r_d 390
Changes in Currency Holdings. 390
Changes in Excess Reserves 390
Overview of the Money Supply Process 391
The Money Multiplier. 391
Deriving the Money Multiplier. 392
Intuition Behind the Money Multiplier 393
Money Supply Response to Changes in the Factors 394
Application The Great Depression Bank Panics, 1930–1933, and the Money Supply 395
Application The 2007–2009 Financial Crisis and the Money Supply 398
Summary. 399
Key Terms 400
Questions. 400
Applied Problems 401
Web Exercises. 402

CHAPTER 17
Tools of Monetary Policy 403
Preview 403

The Framework for the Implementation of Monetary Policy 404
The Large Value Transfer System (LVTS) 404
Non-LVTS (ACSS) Transactions 405
The Bank of Canada's Policy Rate 405
The Operating Band for the Overnight Interest Rate 406
The Bank of Canada's Standing Facilities 406
FYI Monetary Policy Implementation in the LVTS Environment 407
The Bank of Canada's Implementation of the Operating Band for the Overnight Interest Rate 408
The Market for Settlement Balances and the Channel/Corridor System for Setting the Overnight Interest Rate 408
Demand Curve 409
Supply Curve 410
Market Equilibrium 410
Application How the Bank of Canada's Operating Procedures Limit Fluctuations in the Overnight Interest Rate 410
The Bank of Canada's Approach to Monetary Policy 411
FYI Price-level Targeting Versus Inflation-Rate Targeting 411
How Monetary Policy Affects the Economy 412
Nominal Interest Rates and Monetary Policy 413
Open Market Operations 415
Special PRAs 415
SRAs 416
Advantages of SPRAs and SRAs 417
Settlement Balances Management 417
Receiver General Auctions 418
Swaps with the Exchange Fund Account 419
The Target Level of Settlement Balances 420
Application Monetary Control in the Channel/Corridor System 420
Bank of Canada Lending 421
Operation of the Standing Lending Facility 421
Lender of Last Resort 422
Advantages and Disadvantages of the Bank's Lending Policy 423
Inside the Central Bank Emergency Lending Assistance to Troubled Banks 424
Nonconventional Monetary Policy Tools During the Global Financial Crisis 424
Commitment to Future Policy Actions 425
Quantitative Easing 425
Credit Easing 426
Discretionary Liquidity Operations 427
Inside the Central Bank Monetary Policy at Times of Crisis 427
Summary 428
Monetary Policy Tools of the Federal Reserve and the European Central Bank 428
Policy Tools of the Federal Reserve 429
Monetary Policy Tools of the European Central Bank 433
Summary 435
Key Terms 435
Questions 436
Applied Problems 436
Web Exercises 437
Web References 437

CHAPTER 18
The Conduct of Monetary Policy: Strategy and Tactics 438
Preview 438
The Price Stability Goal and the Nominal Anchor 438
The Role of a Nominal Anchor 439
The Time-Inconsistency Problem 439
Other Goals of Monetary Policy 440
High Employment and Output Stability 440
Economic Growth 441
Stability of Financial Markets 441
Interest-Rate Stability 441
Stability in Foreign Exchange Markets 441
Should Price Stability be the Primary Goal of Monetary Policy? 442
Hierarchical Versus Dual Mandates 442
Price Stability as the Primary Long-Run Goal of Monetary Policy 442
Inflation Targeting 443
Inflation Targeting in New Zealand, Canada, and the United Kingdom 443
Advantages of Inflation Targeting 444
Disadvantages of Inflation Targeting 446
Lessons for Monetary Policy Strategy from the Global Financial Crisis 448
Implications for Inflation Targeting 449
How Should Central Banks Respond to Asset-Price Bubbles? 450
Tactics: Choosing the Policy Instrument 454
Criteria for Choosing the Policy Instrument 455

Tactics: The Taylor Rule 457
Inside the Central Bank The Bank of Canada's Use of the Taylor Rule 459
Inside the Central Bank Bank of Canada Watchers. 459
Summary. 460
Key Terms 460
Questions 461
Applied Problems 462
Web Exercises. 462

APPENDIX TO CHAPTER 18
Bank of Canada Policy Procedures: Historical Perspective 463
The Early Years 463
Monetary Targeting, 1975–1981 464
The Checklist Approach, 1982–1988 465
Inflation Targeting, 1989–Present. 466
From Opaqueness to Openness and Accountability 467
Pre-emptive Strikes Against Inflation, Economic Downturns, and Financial Disruptions 467
International Considerations 468

PART 6 International Finance and Monetary Policy 469

CHAPTER 19
The Foreign Exchange Market 470
Preview 470
Foreign Exchange Market 471
  What Are Foreign Exchange Rates? 471
Financial News Foreign Exchange Rates 472
  Why Are Exchange Rates Important? 472
  How Is Foreign Exchange Traded? 473
Exchange Rates in the Long Run 473
  Law of One Price. 473
  Theory of Purchasing Power Parity 474
  Why the Theory of Purchasing Power Parity Cannot Fully Explain Exchange Rates 474
  Factors That Affect Exchange Rates in the Long Run 475
Exchange Rates in the Short Run: A Supply and Demand Analysis. 476
  Supply Curve for Domestic Assets 477
  Demand Curve for Domestic Assets. 477
  Equilibrium in the Foreign Exchange Market. 478
Explaining Changes in Exchange Rates. 478
  Shifts in the Demand for Domestic Assets 479
  Recap: Factors That Change the Exchange Rate 481
Application Effects of Changes in Interest Rates on the Equilibrium Exchange Rate 483
Application Why Are Exchange Rates So Volatile? 485
Application The Global Financial Crisis and the U.S. Dollar 485
Summary. 486
Key Terms 487
Questions 487
Applied Problems 487
Web Exercises. 488

APPENDIX TO CHAPTER 19
The Interest Parity Condition 489
Comparing Expected Returns on Domestic and Foreign Assets 489
Interest Parity Condition 491

CHAPTER 20
The International Financial System 492
Preview 492
Intervention in the Foreign Exchange Market 492
  Foreign Exchange Intervention and the Money Supply 492
  Unsterilized Intervention 494
  Sterilized Intervention. 495
Balance of Payments 496
Global Why the Large U.S. Current Account Deficit Worries Economists. 497
Exchange Rate Regimes in the International Financial System. 497
  Gold Standard 498
  The Bretton Woods System 498

Global The Euro's Challenge to the U.S. Dollar 499
How a Fixed Exchange Rate Regime Works 499
Application How Did China Accumulate Nearly US$3 Trillion of International Reserves? 502
Managed Float 504
European Monetary System (EMS) 504
Application The Foreign Exchange Crisis of September 1992 505
Application Recent Foreign Exchange Crises in Emerging-Market Countries: Mexico in 1994, East Asia in 1997, Brazil in 1999, and Argentina in 2002. 507
Capital Controls 508
Controls on Capital Outflows 508
Controls on Capital Inflows 508
The Role of the IMF 509
Should the IMF Be an International Lender of Last Resort? 509
How Should the IMF Operate? 510
Global The Global Financial Crisis and the IMF 512
International Considerations and Monetary Policy 512
Direct Effects of the Foreign Exchange Market on Monetary Policy 512
Balance-of-Payments Considerations 513
Exchange Rate Considerations. 513
To Peg or Not to Peg: Exchange-Rate Targeting as an Alternative Monetary Policy Strategy. 513
Advantages of Exchange-Rate Targeting 514
Disadvantages of Exchange-Rate Targeting. 514
When Is Exchange-Rate Targeting Desirable for Industrialized Countries?. 516
When Is Exchange-Rate Targeting Desirable for Emerging-Market Countries?. 517
Currency Boards 517
Dollarization 518
Global Argentina's Currency Board 518
Summary. 519
Key Terms 520
Questions 520
Applied Problems 521
Web Exercises. 522

PART 7 **Monetary Theory 523**

CHAPTER 21
Quantity Theory, Inflation, and the Demand for Money 525
Preview 525
Quantity Theory of Money 525
Velocity of Money and Equation of Exchange 526
From the Equation of Exchange to the Quantity Theory of Money. 527
Quantity Theory and the Price Level. 527
Quantity Theory and Inflation 528
Application Testing the Quantity Theory of Money 528
Budget Deficits and Inflation 531
Government Budget Constraint. 531
Hyperinflation 532
Application The Zimbabwean Hyperinflation 532
Keynesian Theories of Money Demand 533
Transactions Motive 533
Precautionary Motive 533
Speculative Motive 533
Putting the Three Motives Together 533
Portfolio Theories of Money Demand 534
Theory of Portfolio Choice and Keynesian Liquidity Preference 534
Other Factors That Affect the Demand for Money. 535
Summary. 535
Empirical Evidence for the Demand for Money. 536
Interest Rates and Money Demand 536
Stability of Money Demand 537
Summary. 537
Key Terms 538
Questions. 538
Applied Problems 539
Web Exercises. 540

CHAPTER 22
The *IS* Curve. 541
Preview 541
Planned Expenditure and Aggregate Demand 542

The Components of Aggregate Demand 542
Consumption Expenditure 542
Planned Investment Spending 543
FYI Meaning of the Word *Investment* 543
Net Exports 545
Government Purchases and Taxes 546
Goods Market Equilibrium 546
Solving for Goods Market Equilibrium 547
Deriving the *IS* Curve 547
Understanding the *IS* Curve 547
What the *IS* Curve Tells Us: Intuition 547
What the *IS* Curve Tells Us: Numerical Example 548
Why the Economy Heads Toward the Equilibrium 549
Factors That Shift the *IS* Curve 549
Changes in Government Purchases 549
Application The Vietnam War Buildup, 1964–1969 550
Changes in Taxes 551
Application The Fiscal Stimulus Package of 2009 552
Changes in Autonomous Spending 553
Changes in Financial Frictions 553
Summary of Factors That Shift the *IS* Curve 553
Summary 555
Key Terms 555
Questions 555
Applied Problems 556
Web Exercises 557

CHAPTER 23

The Monetary Policy and Aggregate Demand Curves 558
Preview 558
The Bank of Canada and Monetary Policy 558
The Monetary Policy Curve 559
The Taylor Principle: Why the Monetary Policy Curve Has an Upward Slope 559
Shifts in the *MP* Curve 560
Application Autonomous Monetary Easing at the Onset of the 2007–2009 Financial Crisis 562
The Aggregate Demand Curve 562
Deriving the Aggregate Demand Curve Graphically 563
Factors That Shift the Aggregate Demand Curve 563
FYI Deriving the Aggregate Demand Curve Algebraically 566
FYI The Zero Lower Bound and Nonconventional Monetary Policy 567
Summary 568
Key Terms 568
Questions 569
Applied Problems 569
Web Exercises 570

CHAPTER 24

Aggregate Demand and Supply Analysis 571
Preview 571
Aggregate Demand 571
Financial News Aggregate Output, Unemployment, and Inflation 572
Deriving the Aggregate Demand Curve 572
Factors That Shift the Aggregate Demand Curve 573
Aggregate Supply 576
Long-Run Aggregate Supply Curve 576
Short-Run Aggregate Supply Curve 577
Shifts in Aggregate Supply Curves 578
Shifts in the Long-Run Aggregate Supply Curve 579
Shifts in the Short-Run Aggregate Supply Curve 579
Equilibrium in Aggregate Demand and Supply Analysis 582
Short-Run Equilibrium 582
How the Short-Run Equilibrium Moves to the Long-Run Equilibrium over Time 582
Self-Correcting Mechanism 585
Changes in Equilibrium: Aggregate Demand Shocks 585
Application The Bank of Canada Disinflation, 1981–1985 586
Application Negative Demand Shocks in the United States, 2001–2004 588
Changes in Equilibrium: Aggregate Supply (Price) Shocks 589
Temporary Supply Shocks 589
Application Negative Supply Shocks, 1973–1975 and 1978–1980 591
Permanent Supply Shocks and Real Business Cycle Theory 592

Application Positive Supply Shocks, 1995–1999 . . . 593
Conclusions . . . 595
AD/AS Analysis of Foreign Business Cycle Episodes . . . 595
Application The United States and the 2007–2009 Financial Crisis . . . 595
Application The United Kingdom and the 2007–2009 Financial Crisis . . . 597
Application China and the 2007–2009 Financial Crisis . . . 598
Summary . . . 600
Key Terms . . . 600
Questions . . . 600
Applied Problems . . . 601
Web Exercises . . . 601

CHAPTER 25
Monetary Policy Theory . . . 602
Preview . . . 602
Response of Monetary Policy to Shocks . . . 602
Response to an Aggregate Demand Shock . . . 603
Application Quantitative (Credit) Easing in Response to the Global Financial Crisis . . . 605
Response to a Permanent Supply Shock . . . 605
Response to a Temporary Supply Shock . . . 607
The Bottom Line: The Relationship Between Stabilizing Inflation and Stabilizing Economic Activity . . . 610
How Actively Should Policymakers Try to Stabilize Economic Activity? . . . 610
Lags and Policy Implementation . . . 610
FYI The Activist/Nonactivist Debate over the Obama Fiscal Stimulus Package in the United States . . . 611
Inflation: Always and Everywhere a Monetary Phenomenon . . . 612
Causes of Inflationary Monetary Policy . . . 613
High Employment Targets and Inflation . . . 613
Summary . . . 616
Key Terms . . . 616
Questions . . . 617
Applied Problems . . . 617
Web Exercises . . . 618

CHAPTER 26
The Role of Expectations in Monetary Policy . . . 619
Preview . . . 619
Lucas Critique of Policy Evaluation . . . 620
Econometric Policy Evaluation . . . 620
Application The Term Structure of Interest Rates . . . 620
Policy Conduct: Rules or Discretion? . . . 621
Discretion and the Time-Inconsistency Problem . . . 621
Types of Rules . . . 622
The Case for Rules . . . 622
FYI The Political Business Cycle and Richard Nixon . . . 623
The Case for Discretion . . . 623
Global The Demise of Monetary Targeting in Switzerland . . . 624
Constrained Discretion . . . 624
The Role of Credibility and a Nominal Anchor . . . 625
Benefits of a Credible Nominal Anchor . . . 625
Credibility and Aggregate Demand Shocks . . . 625
Credibility and Aggregate Supply Shocks . . . 627
Application A Tale of Three Oil Price Shocks . . . 628
Credibility and Anti-Inflation Policy . . . 630
Global Ending the Bolivian Hyperinflation: A Successful Anti-Inflation Program . . . 632
Application Credibility and the Bank of Canada's Victory over Inflation . . . 632
Approaches to Establishing Central Bank Credibility . . . 633
Appoint "Conservative" Central Bankers . . . 633
Summary . . . 634
Key Terms . . . 634
Questions . . . 635
Applied Problems . . . 635
Web Exercises . . . 636

CHAPTER 27
Transmission Mechanisms of Monetary Policy . . . 637
Preview . . . 637
Transmission Mechanisms of Monetary Policy . . . 638
Traditional Interest-Rate Channels . . . 638
Other Asset Price Channels . . . 639
Credit View . . . 642

FYI Consumers' Balance Sheets and the Great Depression 644
    Why Are Credit Channels Likely to Be Important? 645
Application The Great Recession 645
Lessons for Monetary Policy 646
Application Applying the Monetary Policy Lessons to Japan 647
Summary 648
Key Terms 649
Questions 649
Applied Problems 650
Web Exercises 650

Glossary 651

Index 665

Contents on the Web

The following updated chapter and appendices are available on our Companion Website at MyEconLab.

WEB CHAPTER
The *ISLM* Model

Preview
Keynes's Fixed Price Level Assumption and the *IS* Curve
    The *LM* Curve
    Equilibrium in the Market for Money: The *LM* Curve
ISLM Approach to Aggregate Output and Interest Rates
Factors That Cause the *LM* Curve to Shift
Changes in Equilibrium Level of the Interest Rate and Aggregate Output
    Response to a Change in Monetary Policy
    Response to a Change in Fiscal Policy
Application The Economic Stimulus Act of 2008 in the United States
Effectiveness of Monetary Versus Fiscal Policy
    Monetary Policy Versus Fiscal Policy: The Case of Complete Crowding Out
Application Targeting Money Supply Versus Interest Rates
ISLM Model in the Long Run
Summary
Questions and Applied Problems
Web Exercises
Web References

APPENDIX TO WEB CHAPTER
Algebra of the *ISLM* Model

Basic Closed-Economy *ISLM* Model
    IS and *LM* Curves
    Solution of the Model
    Implications
Open-Economy *ISLM* Model
Implications

Web Appendices

Chapter 4: Measuring Interest-Rate Risk: Duration
Chapter 5: Models of Asset Pricing
Chapter 5: Applying the Asset Market Approach to a Commodity Market: The Case of Gold
Chapter 5: Loanable Funds Framework
Chapter 7: Evidence on the Efficient Market Hypothesis
Chapter 10: Banking Crises Throughout the World
Chapter 13: Measuring Bank Performance
Chapter 13: Nonbanking Financial Institutions and Duration Analysis
Chapter 16: The Bank of Canada's Balance Sheet and the Monetary Base
Chapter 16: The M2+ Money Multiplier
Chapter 18: Monetary Targeting
Chapter 20: The Canadian Balance of Payments
Chapter 21: The Baumol-Tobin and the Tobin Mean-Variance Models of the Demand for Money
Chapter 21: Empirical Evidence on the Demand for Money
Chapter 24: The Effects of Macroeconomic Shocks on Asset Prices
Chapter 24: Aggregate Demand and Supply: A Numerical Example
Chapter 24: The Algebra of the Aggregate Demand and Supply Model
Chapter 24: The Taylor Principle and Inflation Stability
Chapter 27: Evaluating Empirical Evidence: The Debate over the Importance of Money in Economic Fluctuations

Mini-Cases

Chapter 4: Interest Rates, Bond Yields, and Duration

Chapter 5: The Behaviour of Interest Rates

Chapter 6: Yield Curve Hypotheses and the Effects of Economic Events

Chapter 7: Adaptive Expectations, Rational Expectations, and Optimal Forecasts

Chapter 11: The Changing Landscape for Domestic and Global Financial Markets

Chapter 13: Bank Performance Analysis

Chapter 13: Calculating and Comparing Gap, Duration, and Risk Management Alternatives

Chapter 19: The Foreign Exchange Market and Financial Derivatives

This page intentionally left blank

Preface

Hallmarks

Although this text has undergone a major revision, it retains the basic hallmarks that have made it the best-selling textbook on money and banking over the past four editions:

- A unifying, analytic framework that uses a few basic economic principles to organize students' thinking about the structure of financial markets, the foreign exchange markets, financial institution management, and the role of monetary policy in the economy
- A careful, step-by-step development of models (an approach found in the best principles of economics textbooks), which makes it easier for students to learn
- The complete integration of an international perspective throughout the text
- A thoroughly up-to-date treatment of the latest developments in monetary theory
- Special features called "Financial News" to encourage reading of financial newspapers
- An applications-oriented perspective with numerous applications and special-topic boxes that increase students' interest by showing them how to apply theory to real-world examples

What's New in the Fifth Canadian Edition

In addition to the expected updating of all data whenever possible, there is major new material in every part of the text.

Revised Chapter 9: Financial Crises

The previous edition of this textbook contained a new chapter on financial crises, including the most recent one. It was written, however, before the global financial crisis was over. Now with the perspective of a couple of years after the crisis, we have been able to improve this chapter substantially, first, by completely reorganizing the chapter to tell a more coherent story and second, by adding new sections, such as the run on the shadow banking system. In addition, we have added new boxes on the process of securitization, collateralized debt obligations (CDOs), Ireland and the financial crisis, and the Greek sovereign debt crisis. The material in this chapter continues to be very exciting for students. Indeed, students continue to be more engaged with this material.

Compelling New Material on the Global Financial Crisis Throughout the Text

The aftermath of the global financial crisis of 2007–2009 has led to ongoing changes in the structure of the financial system and the way central banks operate. This has required the addition of many timely new sections, applications, and boxes throughout the rest of the book.

- A new box on Ireland and the 2007–2009 financial crisis (Chapter 9)
- A new box on Greece and the European sovereign debt crisis (Chapter 9)
- A new box on Canada and the 2007–2009 financial crisis (Chapter 9)

- A new box on the Basel Accord and the global financial crisis (Chapter 10)
- A new box on credit default swaps on Greek debt (Chapter 12)
- A new box on the U.S. money supply during the 2007–2009 crisis (Chapter 16)
- A new section on nonconventional monetary policy tools (Chapter 17)
- A new section on monetary policy tools by the Fed and the ECB (Chapter 17)
- A new box on price-level targeting versus inflation-rate targeting (Chapter 17)
- A new section on lessons for monetary policy strategy from the global financial crisis (Chapter 18)
- A new application on the U.S. fiscal stimulus package of 2009 (Chapter 22)
- A new box on the zero lower bound and nonconventional policy (Chapter 23)
- A new application on autonomous monetary policy easing in Canada at the onset of the global financial crisis (Chapter 23)
- A new application on negative supply shocks in Canada (Chapter 24)
- A new application on positive supply shocks in Canada (Chapter 24)
- A new application on negative supply and demand shocks in the United States and the 2007–2009 financial crisis (Chapter 24)
- A new application on the United Kingdom and the 2007–2009 financial crisis (Chapter 24)
- A new application on China and the 2007–2009 financial crisis (Chapter 24)
- A new application on quantitative (credit) easing in response to the global financial crisis (Chapter 25)
- A new box on the activist/nonactivist debate over the Obama fiscal stimulus package in the United States (Chapter 25)
- A new application on the effects of three oil price shocks on the Canadian economy (Chapter 26)
- A new application on credibility and the Bank of Canada's victory over inflation (Chapter 26)

Additional New Material on Financial Markets and Institutions and Monetary Policy

There have also been changes in financial markets and institutions in recent years that have not been directly related to the global subprime financial crisis, and we have added the following new material to keep the text current:

- A new section on why the efficient market hypothesis does not imply that financial markets are efficient (Chapter 7)
- A new box on the securitization process (Chapter 9)
- A new box on collateralized debt obligations (CDOs) (Chapter 9)
- A new section on the monetary policy tools in Canada (Chapter 17)
- A new section on the policy trilemma (Chapter20)
- A new application on the Zimbabwean hyperinflation (Chapter 21)
- A new box on the demise of monetary targeting in Switzerland (Chapter 26)
- A new box on the political business cycle (Chapter 26)
- A new application on a tale of three oil price shocks (Chapter 26)

A Dynamic Approach to Monetary Theory

In past editions, we have used the *ISLM* model and a static aggregate demand and supply (*AD/AS*) framework, in which the price level is on the vertical axis in *AD/AS* diagrams to discuss monetary theory. Over the years, we have found it more

and more difficult to teach with this framework because it does not emphasize the dynamic interaction of inflation with economic activity, which is what modern monetary theory is all about. In this edition, we have completely rewritten Chapters 22 to 26 to develop a powerful, dynamic aggregate demand and supply model that highlights the interaction of inflation and economic activity by putting inflation on the vertical axis in the *AD/AS* diagram.

We build the dynamic *AD/AS* model step-by-step in Chapters 22 to 24.

- Chapter 22 develops the first building block of the aggregate demand and supply model, the *IS curve*.
- Chapter 23 describes how monetary policymakers set real interest rates with the *monetary policy (MP) curve*, which describes the relationship between inflation and real interest rates. It then uses the *MP* curve to derive the dynamic aggregate demand curve.
- Chapter 24 derives the short- and long-run aggregate supply curves and then puts all of them together with the aggregate demand curve to develop the dynamic aggregate demand and supply model. This model is then put to use with numerous applications analyzing business cycle fluctuations in Canada and in foreign countries.

The dynamic *AD/AS* model is then used to conduct a modern treatment of monetary policy in Chapters 25 and 26.

- Chapter 25 examines the theory of monetary policy and enables students to understand how monetary policymakers can respond to shocks to the economy in order to stabilize both inflation and economic activity.
- Chapter 26 looks at the role of expectations in monetary policy and discusses such issues as the Lucas critique, the rules versus discretion debate, and the role of credibility in producing good policy outcomes.

In addition, we have revised Chapter 21 to make it more dynamic by emphasizing the link between the demand for money, quantity theory, and inflation.

The Interaction of Finance and Monetary Theory

In the aftermath of the global financial crisis, monetary theory has been challenged by critics as being inadequate because in the past it has not given a prominent role to finance in economic fluctuations. In response, economists are now focusing on the link from finance to economic fluctuations in recent research, but this has not yet been reflected in textbooks. This book is the first textbook that we know of that responds to the challenges raised by critics of monetary theory by bringing finance directly into the aggregate demand and supply model at the outset. Barriers to the efficient functioning of financial markets from asymmetric information problems, known as financial frictions, are treated as one of the key factors affecting aggregate demand when this concept is first discussed. Then the impact of increases in financial frictions, as occurred during the global financial crisis, are easy to analyze using the aggregate demand and supply model. By emphasizing the interaction of finance and monetary theory, this book greatly enhances the realism of the aggregate demand and supply model, increasing the relevance of the analysis in the monetary theory part of the book.

End-of-Chapter Questions and Applied Problems

Because students best learn by doing, in this edition we have substantially expanded the number of end-of-chapter questions and problems for each chapter. We have also added a new type of problem under the heading of "Applied Problems." These problems are more analytical and applied and so give the student more hands-on practice applying the economic concepts in the text.

Chapters, Appendices, and Mini-Cases on the Web

The MyEconLab website that accompanies this book (**www.myeconlab.com**) is an essential resource for additional content.

The web chapter for the fifth Canadian edition of *The Economics of Money, Banking, and Financial Markets* is Web Chapter 1: The *ISLM* Model.

The web appendices include

Chapter 4:	Measuring Interest-Rate Risk: Duration
Chapter 5:	Models of Asset Pricing
Chapter 5:	Applying the Asset Market Approach to a Commodity Market: The Case of Gold
Chapter 5:	Loanable Funds Framework
Chapter 7:	Evidence on the Efficient Market Hypothesis
Chapter 10:	Banking Crises Throughout the World
Chapter 13:	Measuring Bank Performance
Chapter 13:	Nonbanking Financial Institutions and Duration Analysis
Chapter 16:	The Bank of Canada's Balance Sheet and the Monetary Base
Chapter 16:	The M2+ Money Multiplier
Chapter 18:	Monetary Targeting
Chapter 20:	The Canadian Balance of Payments
Chapter 21:	The Baumol-Tobin and the Tobin Mean-Variance Models of the Demand for Money
Chapter 21:	Empirical Evidence on the Demand for Money
Chapter 24:	The Effects of Macroeconomic Shocks on Asset Prices
Chapter 24:	Aggregate Demand and Supply: A Numerical Example
Chapter 24:	The Algebra of the Aggregate Demand and Supply Model
Chapter 24:	The Taylor Principle and Inflation Stability
Chapter 27:	Evaluating Empirical Evidence: The Debate over the Importance of Money in Economic Fluctuations

Mini-cases available on MyEconLab include

Chapter 4:	Interest Rates, Bond Yields, and Duration
Chapter 5:	The Behaviour of Interest Rates
Chapter 6:	Yield Curve Hypotheses and the Effects of Economic Events
Chapter 7:	Adaptive Expectations, Rational Expectations, and Optimal Forecasts
Chapter 11:	The Changing Landscape for Domestic and Global Financial Markets
Chapter 13:	Bank Performance Analysis

Chapter 13: Calculating and Comparing Gap, Duration, and Risk-Management Alternatives

Chapter 19: The Foreign Exchange Market and Financial Derivatives

Instructors can either use these web appendices and mini-cases in class to supplement the material in the textbook or recommend them to students who want to expand their knowledge of the money and banking field. The answers to the web mini-cases are available in the Instructor's Manual.

Flexibility and Modularity

In using previous editions, adopters, reviewers, and survey respondents have continually praised this text's flexibility and modularity, that is, the ability to pick and choose which chapters to cover and in what order to cover them. Flexibility and modularity are especially important in the money and banking course because there are as many ways to teach this course as there are instructors. To satisfy the diverse needs of instructors, the text achieves flexibility as follows:

- Core chapters provide the basic analysis used throughout the book, and other chapters or sections of chapters can be used or omitted according to instructor preferences. For example, Chapter 2 introduces the financial system and basic concepts such as transaction costs, adverse selection, and moral hazard. After covering Chapter 2, the instructor may decide to give more detailed coverage of financial structure by assigning Chapter 8, or may choose to skip Chapter 8 and take any of a number of different paths through the book.
- The text also allows instructors to cover the most important issues in monetary theory and policy without having to do detailed development of the *IS*, *MP*, and *AD* curves in Chapters 22 and 23. Instructors who want to teach a more complete treatment of monetary theory would make use of these chapters.
- Part VII on monetary theory can easily be taught before Part IV of the book in order to give students a deeper understanding of the rationale for monetary policy.
- Chapter 27 on the transmission mechanisms of monetary policy can be taught at many different points in the course—either with Part IV of the book when monetary policy is discussed or with Chapter 22 or Chapter 24 when the concept of aggregate demand is developed. It could be taught at the end of the book as a special topic.
- The internationalization of the text through marked international sections within chapters, as well as through complete separate chapters on the foreign exchange market and the international monetary system, is comprehensive yet flexible. Although many instructors will teach all the international material, others will not. Instructors who want less emphasis on international topics can easily skip Chapter 19 on the foreign exchange market and Chapter 20 on the international financial system and monetary policy. The international sections within chapters are self-contained and can be omitted with little loss of continuity.

To illustrate how this book can be used for courses with varying emphases, several course outlines are suggested for a semester teaching schedule. More detailed

information about how the text can be used flexibly in your course is available in the Instructor's Manual.

- *General Money and Banking Course:* Chapters 1–5, 10–13, 17, 18, 24–25, with a choice of 6 of the remaining 14 chapters.
- *General Money and Banking Course with an International Emphasis:* Chapters 1–5, 10–13, 17–20, 24–25, with a choice of 4 of the remaining 12 chapters.
- *Financial Markets and Institutions Course:* Chapters 1–14, with a choice of 7 of the remaining 13 chapters.
- *Monetary Theory and Policy Course:* Chapters 1–5, 15–18, 21–26, with a choice of 4 of the remaining 12 chapters.

Pedagogical Aids

In teaching theory or its applications, a textbook must be a solid motivational tool. To this end, we have incorporated a wide variety of pedagogical features to make the material easy to learn:

1. **Previews** at the beginning of each chapter tell students where the chapter is heading, why specific topics are important, and how they relate to other topics in the book.
2. **Applications**, numbering around 50, demonstrate how the analysis in the book can be used to explain many important real-world situations.
3. **Financial News boxes** introduce students to relevant news articles and data that are reported daily in the press and explain how to read them.
4. **Inside the Central Bank boxes** give students a feel for what is important in the operation and structure of central banks.
5. **Global boxes** include interesting material with an international focus.
6. **FYI boxes** highlight dramatic historical episodes, interesting ideas, and intriguing facts related to the subject matter.
7. **Key statements** are important points set in boldface italic type so that students can easily find them for later reference.
8. **Graphs** with captions, numbering more than 150, help students clearly understand the interrelationship of the variables plotted and the principles of analysis.
9. **Summary** at the end of each chapter list the main points covered.
10. **Key terms** are important words or phrases, boldface when they are defined for the first time and listed by page number at the end of the chapter.
11. **End-of-chapter questions and problems**, numbering more than 600, help students learn the subject matter by applying economic concepts.
12. **Web Exercises** encourage students to collect information from online sources or use online resources to enhance their learning experience.
13. **Web Sources** report the Web URL source of the data used to create the many tables and charts.
14. **Web References** point the student to websites that provide information or data that supplement the text material.
15. **Glossary** at the back of the book provides definitions of all the key terms.

An Easier Way to Teach: Supplements to Accompany the Fifth Canadian Edition

The Economics of Money, Banking, and Financial Markets, Fifth Canadian Edition, includes the most comprehensive program of supplements of any money, banking, and financial markets textbook. These items are available to qualified domestic adopters but in some cases may not be available to international adopters.

MyEconLab

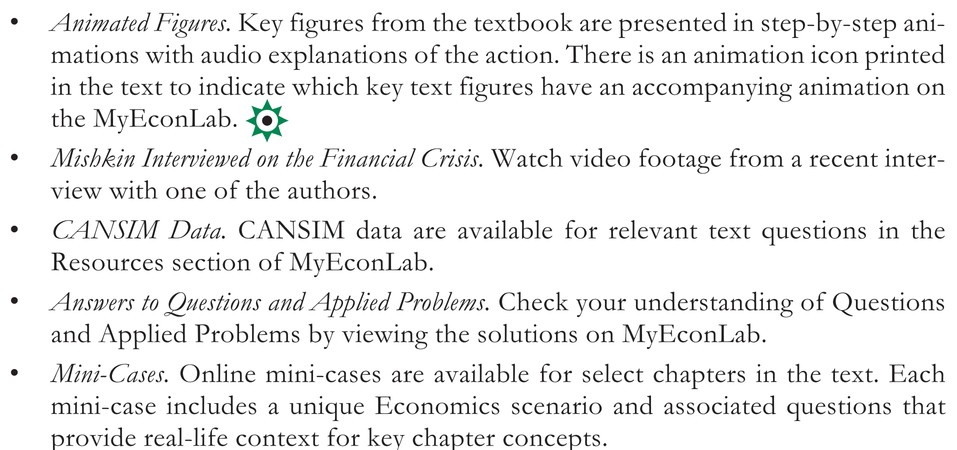
MyEconLab is the premier online assessment and tutorial system, pairing rich online content with innovative learning tools. The MyEconLab course for the Fifth Canadian Edition of *The Economics of Money, Banking, and Financial Markets* includes online versions of end-of-chapter Questions and Applied Problems from the text as well as additional questions for further study, which can be easily assigned and automatically graded.

STUDENTS AND MYECONLAB This online homework and tutorial system puts students in control of their own learning through a suite of study and practice tools correlated with the online, interactive version of the textbook and other media tools. Within MyEconLab's structured environment, students practise what they learn, test their understanding, and then pursue a study plan that MyEconLab generates for them based on their performance on practice tests.

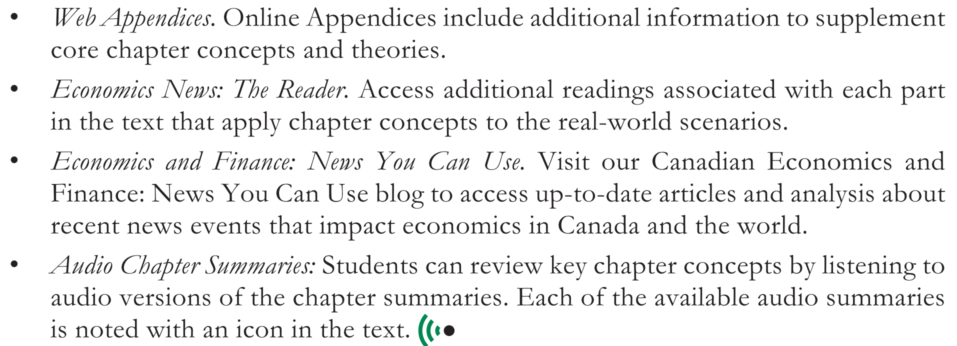
INSTRUCTORS AND MYECONLAB MyEconLab provides flexible tools that allow instructors to easily and effectively customize online course materials to suit their needs. Instructors can create and assign tests, quizzes, or homework assignments. MyEconLab saves time by automatically grading all questions and tracking results in an online grade book. MyEconLab can even grade assignments that require students to draw a graph.

After registering for MyEconLab, instructors have access to downloadable supplements such as an instructor's manual, PowerPoint lecture notes, and the test bank. The test bank can also be used within MyEconLab, giving instructors ample material from which they can create assignments.

Additional MyEconLab features include



- *Animated Figures*. Key figures from the textbook are presented in step-by-step animations with audio explanations of the action. There is an animation icon printed in the text to indicate which key text figures have an accompanying animation on the MyEconLab.
- *Mishkin Interviewed on the Financial Crisis*. Watch video footage from a recent interview with one of the authors.
- *CANSIM Data*. CANSIM data are available for relevant text questions in the Resources section of MyEconLab.
- *Answers to Questions and Applied Problems*. Check your understanding of Questions and Applied Problems by viewing the solutions on MyEconLab.
- *Mini-Cases*. Online mini-cases are available for select chapters in the text. Each mini-case includes a unique Economics scenario and associated questions that provide real-life context for key chapter concepts.



- *Web Appendices*. Online Appendices include additional information to supplement core chapter concepts and theories.
- *Economics News: The Reader*. Access additional readings associated with each part in the text that apply chapter concepts to the real-world scenarios.
- *Economics and Finance: News You Can Use*. Visit our Canadian Economics and Finance: News You Can Use blog to access up-to-date articles and analysis about recent news events that impact economics in Canada and the world.
- *Audio Chapter Summaries:* Students can review key chapter concepts by listening to audio versions of the chapter summaries. Each of the available audio summaries is noted with an icon in the text.

For more information and to register, please visit **www.myeconlab.com**.

Additional Instructor Resources

1. **Instructor's Manual** Prepared by the authors, the Instructor's Manual provides conventional elements such as sample course outlines, chapter outlines, and answers to questions and problems in the text.
2. **PowerPoint® Slides** A complete set of slides that are specifically designed for the textbook is available electronically.
3. **TestGen** The computerized test bank allows the instructor to produce exams efficiently. This product consists of multiple-choice and short-answer questions and offers editing capabilities. It is available in Windows and Macintosh versions.
4. **Test Item File in Word** This test bank includes all the questions from the TestGen version in Microsoft Word format.
5. **Image Library** This library contains .gif or .jpg versions of figures from the textbook.

Additional Student Resources

1. **Technology Specialists** Pearson's Technology Specialists work with faculty and campus course designers to ensure that Pearson technology products, assessment tools, and online course materials are tailored to meet your specific needs. This highly qualified team is dedicated to helping schools take full advantage of a wide range of educational resources by assisting in the integration of a variety of instructional materials and media formats. Your local Pearson Education sales representative can provide you with more details on this service program.
2. **CourseSmart** is a new way for instructors and students to access textbooks online anytime from anywhere. With thousands of titles across hundreds of courses, CourseSmart helps instructors choose the best textbook for their class and give their students a new option for buying the assigned textbook as a lower cost eTextbook. For more information, visit **www.coursesmart.com**.

Acknowledgments

This book is the result of efforts by many people. We are extremely grateful to Claudine O'Donnell, Acquisitions Editor; Jen Parks, Sponsoring Editor; Rebecca Ryoji, Developmental Editor; Sarah Lukaweski, Project Manager; Susan Bindernagel, Copy Editor; Therese Trainor, MyEconLab Content Development Author; and the many others at Pearson Canada who have contributed to the completion of this edition.

We are also grateful to all of the many people who commented on various chapters of the book, made valuable suggestions, and kindly provided us with data. We

would particularly like to thank the following reviewers whose comments on the manuscript contributed to the development of this edition:

Ramesh Bhardwaj, George Brown College

Suzanne Iskander, Humber ITAL and Guelph Humber University

Michael Ho, University of Toronto

Frank Ingold, George Brown College

Dan Otchere, Concordia University

Narine Grigoryan, Camosun College

Alison Coffin, Memorial University

Duane Rockerbie, University of Lethbridge

Although we have done our best to make this edition as complete and error free as possible, as most of you know, perfection is impossible. We would greatly appreciate any suggestions for improvement. Please send your comments to serletis@ucalgary.ca.

Frederic S. Mishkin
Apostolos Serletis
2013

About the Authors

Frederic S. Mishkin is the Alfred Lerner Professor of Banking and Financial Institutions at the Graduate School of Business, Columbia University. He is also a Research Associate at the National Bureau of Economic Research and past president of the Eastern Economics Association. Since receiving his Ph.D. from the Massachusetts Institute of Technology in 1976, he has taught at the University of Chicago, Northwestern University, Princeton University, and Columbia. He has also received an honorary professorship from the People's (Renmin) University of China. From 1994 to 1997, he was Executive Vice President and Director of Research at the Federal Reserve Bank of New York and an associate economist of the Federal Open Market Committee of the Federal Reserve System. From September 2006 to August 2008, he was a member (governor) of the Board of Governors of the Federal Reserve System.

Professor Mishkin's research focuses on monetary policy and its impact on financial markets and the aggregate economy. He is the author of more than fifteen books, including *Financial Markets and Institutions*, Sixth Edition (Addison-Wesley, 2009); *Monetary Policy Strategy* (MIT Press, 2007); *The Next Great Globalization: How Disadvantaged Nations Can Harness Their Financial Systems to Get Rich* (Princeton University Press, 2006); *Inflation Targeting: Lessons from the International Experience* (Princeton University Press, 1999); *Money, Interest Rates, and Inflation* (Edward Elgar, 1993); and *A Rational Expectations Approach to Macroeconometrics: Testing Policy Ineffectiveness and Efficient Markets Models* (University of Chicago Press, 1983). In addition, he has published more than 150 articles in such journals as *American Economic Review*, *Journal of Political Economy*, *Econometrica*, *Quarterly Journal of Economics*, *Journal of Finance*, and *Journal of Monetary Economics*.

Professor Mishkin has served on the editorial board of *American Economic Review* and has been an associate editor at *Journal of Business and Economic Statistics*, the *Journal of Applied Econometrics,* and *Journal of Money, Credit and Banking*; he also served as the editor of the Federal Reserve Bank of New York's *Economic Policy Review*. He is currently an associate editor (member of the editorial board) at six academic journals, including *Macroeconomics and Monetary Economics Abstracts; Journal of International Money and Finance; International Finance; Finance India; Economic Policy Review*; and *Emerging Markets, Finance and Trade*. He has been a consultant to the Board of Governors of the Federal Reserve System, the World Bank, and the International Monetary Fund, as well as to many central banks throughout the world. He was also a member of the International Advisory Board to the Financial Supervisory Service of South Korea and an adviser to the Institute for Monetary and Economic Research at the Bank of Korea. Professor Mishkin was a Senior Fellow at the Federal Deposit Insurance Corporation's Center for Banking Research and was an academic consultant to and served on the Economic Advisory Panel of the Federal Reserve Bank of New York.

Apostolos Serletis is Professor of Economics and Finance at the University of Calgary. Since receiving his Ph.D. from McMaster University in 1984, he has held visiting appointments at the University of Texas at Austin, the Athens University of Economics and Business, and the Research Department of the Federal Reserve Bank of St. Louis.

Professor Serletis' teaching and research interest focus on monetary and financial economics, macroeconometrics, and nonlinear and complex dynamics. He is the author of twelve books, including *Principles of Economics* (First Canadian Edition), with R. Glenn Hubbard, Anthony Patrick O'Brien, and Jason Childs (Pearson forthcoming), *Macroeconomics: A Modern Approach* (First Canadian Edition), with Robert J. Barro (Nelson 2010), *The Demand for Money: Theoretical and Empirical Approaches* (Springer 2007), *Financial Markets and Institutions: Canadian Edition*, with Frederic S. Mishkin and Stanley G. Eakins (Addison-Wesley 2004), and *The Theory of Monetary Aggregation*, co-edited with William A. Barnett (Elsevier 2000). In addition, he has published over 200 articles in such journals as the *Journal of Economic Literature, Journal of Monetary Economics, Journal of Money, Credit, and Banking, Journal of Econometrics, Journal of Applied Econometrics, Journal of Business and Economic Statistics, Macroeconomic Dynamics, Journal of Banking and Finance, Journal of Economic Dynamics and Control, Economic Inquiry, Canadian Journal of Economics*, and *Studies in Nonlinear Dynamics and Econometrics*.

Professor Serletis is Associate Editor of two academic journals, *Macroeconomic Dynamics* and *Energy Economics*. He is also a member of the editorial board at two journals, the *Journal of Economic Asymmetries* and the *Journal of Economic Studies*. He is listed in a variety of directories, including *Who's Who in Economics* and *Who's Who in the World*.

This page intentionally left blank

THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS

FIFTH CANADIAN EDITION

This page intentionally left blank

PART I

Introduction

Chapter 1 Why Study Money, Banking, and Financial Markets?

Chapter 2 An Overview of the Financial System

Chapter 3 What Is Money?

Crisis and Response: Global Financial Crisis and Its Aftermath

The global financial crisis that started in the United States in August 2007 was the result of a credit-driven, asset-price bubble in the U.S. housing market. When that bubble burst, the value of mortgage-backed securities held by financial institutions plummeted. The crisis ended up bringing down the financial system, which led not only to an economic downturn and a rise in unemployment in the United States, but also to a global recession. Governments around the world worked on full-scale banking bailouts and rescue packages adding up to trillions of dollars. However, even with these aggressive actions to stabilize the financial system, four years after the crisis economies throughout the world were still experiencing problems and the finances of many governments were in tatters.

The global financial crisis and its aftermath demonstrate the importance of banks and the financial system to economic well-being and the major role of money in the economy. Part I of this book provides an introduction to the study of money, banking, and financial markets. Chapter 1 outlines a road map of the book and discusses why it is so worthwhile to study the field of money, banking, and financial markets. Chapter 2 provides a general overview of the financial system. Chapter 3 then explains what money is and how it is measured.

CHAPTER 1

Why Study Money, Banking, and Financial Markets?

LEARNING OBJECTIVES

After studying this chapter you should be able to

1. outline what is involved in the study of financial markets (such as bonds, stocks, and foreign exchange markets)
2. identify what it means to study financial institutions (i.e., banks, insurance companies, mutual funds)
3. describe why money is a major influence on inflation, business cycles, and interest rates

PREVIEW

On the evening news, you hear that the Bank of Canada is raising the overnight interest rate by one-half of a percentage point. What effect might this have on the interest rate of an automobile loan when you finance your purchase of a sleek new sports car? Does it mean that a house will be more or less affordable in the future? Will it make it easier or harder for you to get a job next year?

This book provides answers to these and other questions by examining how financial markets (such as those for bonds, stocks, and foreign exchange) and financial institutions (chartered banks, trust and mortgage loan companies, credit unions and *caisses populaires*, insurance companies, mutual fund companies, and other institutions) work and by exploring the role of money in the economy. Financial markets and institutions not only affect your everyday life but also involve flows of billions of dollars of funds through our economy, which in turn affect business profits, the production of goods and services, and even the economic well-being of countries other than Canada. What happens to financial markets, financial institutions, and money is of great concern to politicians and can even have a major impact on elections. The study of money, banking, and financial markets will reward you with an understanding of many exciting issues. In this chapter we provide a road map of the book by outlining these issues and exploring why they are worth studying.

Why Study Financial Markets?

Part II of this book focuses on **financial markets**, markets in which funds are transferred from people who have an excess of available funds to people who have a shortage. Financial markets such as bond and stock markets are crucial to promoting greater economic efficiency by channelling funds from people who do not

have a productive use for them to those who do. Well-functioning financial markets are a key factor in producing high economic growth and poorly performing financial markets are one reason that many countries in the world remain desperately poor. Activities in financial markets also have direct effects on personal wealth, the behaviour of businesses and consumers, and the cyclical performance of the economy.

The Bond Market and Interest Rates

A **security** (also called a *financial instrument*) is a claim on the issuer's future income or **assets** (any financial claim or piece of property that is subject to ownership). A **bond** is a debt security that promises to make payments periodically for a specified period of time.[1] The bond market is especially important to economic activity because it enables corporations and governments to borrow to finance their activities and because it is where interest rates are determined. An **interest rate** is the cost of borrowing or the price paid for the rental of funds (usually expressed as a percentage of the rental of $100 per year). There are many interest rates in the economy—mortgage interest rates, car loan rates, and interest rates on many different types of bonds.

Interest rates are important on a number of levels. On a personal level, high interest rates could deter you from buying a house or a car because the cost of financing it would be high. Conversely, high interest rates could encourage you to save because you can earn more interest income by putting aside some of your earnings as savings. On a more general level, interest rates have an impact on the overall health of the economy because they affect not only consumers' willingness to spend or save but also businesses' investment decisions. High interest rates, for example, may cause a corporation to postpone building a new plant that would ensure more jobs.

Because changes in interest rates have important effects on individuals, financial institutions, businesses, and the overall economy, it is important to explain fluctuations in interest rates that have been substantial over the past twenty years. For example, the interest rate on three-month Treasury bills peaked at over 20% in August 1981. This interest rate then fell to a low of less than 3% in 1997, rose to near 5% in the late 1990s, fell to a low of 2% in the early 2000s, rose to above 4% by 2007, only to fall close to zero in 2008 and remain around 1% since then.

Because different interest rates have a tendency to move in unison, economists frequently lump interest rates together and refer to "the" interest rate. As Figure 1-1 shows, however, interest rates on several types of bonds can differ substantially. The interest rate on three-month Treasury bills, for example, fluctuates more than the other interest rates and is lower on average. The interest rate on long-term corporate bonds is higher on average than the other interest rates, and the spread between it and the other rates fluctuates over time.

In Chapter 2 we study the role of bond markets in the economy, and in Chapters 4 through 6 we examine what an interest rate is, how the common movements in interest rates come about, and why the interest rates on different bonds vary.

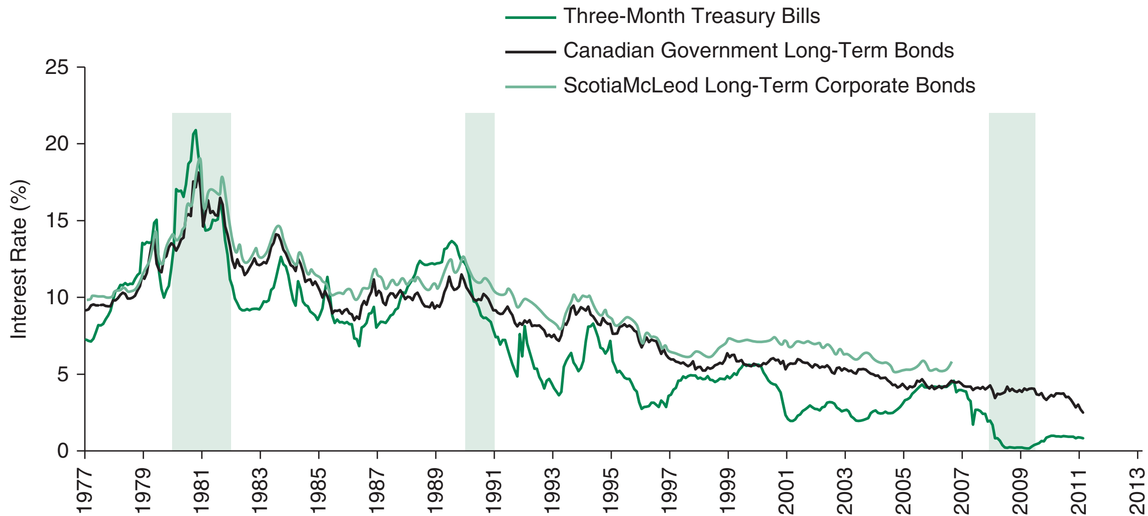
The Stock Market

A **common stock** (typically just called a *stock*) represents a share of ownership in a corporation. It is a security that is a claim on the earnings and assets of the corporation. Issuing stock and selling it to the public is a way for corporations to raise

[1]The definition of *bond* used throughout this book is the broad one in common use by academics, which covers short-term as well as long-term debt instruments. However, some practitioners in financial markets use the word *bond* only to describe specific long-term debt instruments such as corporate bonds or Canada bonds.

FIGURE 1-1 Interest Rates on Selected Bonds, 1977–2012

Although different interest rates have a tendency to move in unison, they do often differ substantially and the spreads between them fluctuate.



Note: Shaded areas represent recessions.

Source: Statistics Canada CANSIM II Series V122531, V122544, and V122518.

funds to finance their activities. The stock market, in which claims on the earnings of corporations (shares of stock) are traded, is the most widely followed financial market in almost every country that has one (that's why it is often called simply "the market"). A big swing in the prices of shares in the stock market is always a big story on the evening news. People often speculate on where the market is heading and get very excited when they can brag about their latest "big killing," but they become depressed when they suffer a big loss. The attention the market receives can probably be best explained by one simple fact: it is a place where people get rich—and poor—quickly.

As Figure 1-2 indicates, stock prices are extremely volatile. After the market rose in the 1980s, on "Black Monday," October 19, 1987, it experienced the worst one-day drop in its entire history, with the S&P/TSX Composite Index falling by 11%. From then until 2000, the stock market experienced one of the great bull markets in its history, with the S&P/TSX climbing to a peak of over 11 000. With the collapse of the high-tech bubble in 2000, the stock market fell sharply, dropping by over 40% by late 2002. It then rose to an all-time high above the 14 000 level in early 2008, only to fall close to 8000 early in 2009, but recovered again to close to 14 000 by early 2011. These considerable fluctuations in stock prices affect the size of people's wealth and, as a result, may affect their willingness to spend.

The stock market is also an important factor in business investment decisions because the price of shares affects the amount of funds that can be raised by selling newly issued stock to finance investment spending. A higher price for a firm's shares allows the firm to raise a larger amount of funds that can be used to buy production facilities and equipment.

In Chapter 2 we examine the role that the stock market plays in the financial system, and we return to the issue of how stock prices behave and respond to information in the marketplace in Chapter 7.

FIGURE 1-2 Stock Prices as Measured by the S&P/TSX Composite Index, 1956–2012

Stock prices are extremely volatile.

Source: Statistics Canada CANSIM II Series V122620.

Why Study Financial Institutions and Banking?

Part III of this book focuses on financial institutions and the business of banking. Banks and other financial institutions are what make financial markets work. Without them, financial markets would not be able to move funds from people who save to people who have productive investment opportunities. Thus they play a crucial role in the economy.

Structure of the Financial System

The financial system is complex, comprising many different types of private-sector financial institutions, including banks, insurance companies, mutual funds, finance companies, and investment banks, all of which are heavily regulated by the government. If an individual wanted to make a loan to Bombardier or Research In Motion, for example, they would not go directly to the president of the company and offer a loan. Instead, they would lend to such companies indirectly through **financial intermediaries**, institutions that borrow funds from people who have saved and in turn make loans to others.

Why are financial intermediaries so crucial to well-functioning financial markets? Why do they extend credit to one party but not to another? Why do they usually write complicated legal documents when they extend loans? Why are they the most heavily regulated businesses in the economy?

We answer these questions in Chapter 8 by developing a coherent framework for analyzing financial structure in Canada and in the rest of the world.

Financial Crises

At times, the financial system seizes up and produces **financial crises**, major disruptions in financial markets that are characterized by sharp declines in asset prices and failures of many financial and nonfinancial firms. Financial crises have been a feature of capitalist economies for hundreds of years and are typically followed by the worst business-cycle downturns. Starting in August of 2007, the United States economy was hit by the worst financial disruption since the Great Depression. Defaults in subprime residential mortgages led to major losses in financial institutions, producing

not only numerous bank failures, but also the demise of Bear Stearns and Lehman Brothers, two of the largest investment banks in the United States. Chapter 9 discusses why these crises occur and how they can do so much damage to the economy.

Banks and Other Financial Institutions

Banks are financial institutions that accept deposits and make loans. Included under the term *banks* are firms such as chartered banks, trust and mortgage loan companies, and credit unions and *caisses populaires*. Banks are the financial intermediaries that the average person interacts with most frequently. A person who needs a loan to buy a house or a car usually obtains it from a local bank. Most Canadians keep a large proportion of their financial wealth in banks in the form of chequing accounts, savings accounts, or other types of bank deposits. Because banks are the largest financial intermediaries in our economy, they deserve the most careful study. However, banks are not the only important financial institutions. Indeed, in recent years, other financial institutions such as insurance companies, finance companies, pension funds, mutual funds, and investment banks have been growing at the expense of banks, and so we need to study them as well.

In Chapter 11 we look at the banking industry, examine how the competitive environment has changed in the industry and learn why some financial institutions have been growing at the expense of others. In Chapter 10 we extend the economic analysis from Chapter 8 to understand why bank regulation takes the form it does and what can go wrong in the regulatory process. In Chapter 12 we identify the differences between banks and nonbank financial institutions and explain the regulation of nonbank financial institutions in the context of adverse selection and moral hazard problems.

In Chapter 13 we examine how banks and other financial institutions manage their assets and liabilities to make profits. Because the economic environment for banks and other financial institutions has become increasingly risky, these institutions must find ways to manage risk. How they manage risk with financial derivatives is the topic of Chapter 14.

Financial Innovation

Financial innovation, the development of new financial products and services, can be an important force for good by making the financial system more efficient. Unfortunately, as we will see in Chapter 9, financial innovation can have a dark side: it can lead to devastating financial crises, such as the one we have recently experienced. In Chapter 11 we study why and how financial innovation takes place, with particular emphasis on how the dramatic improvements in information technology have led to new financial products and the ability to deliver financial services electronically, in what has become known as **e-finance**. We also study financial innovation because it shows us how creative thinking on the part of financial institutions can lead to higher profits but can sometimes result in financial disasters. By seeing how and why financial institutions have been creative in the past, we obtain a better grasp of how they may be creative in the future. This knowledge provides us with useful clues about how the financial system may change over time and will help keep our knowledge about banks and other financial institutions from becoming obsolete.

Why Study Money and Monetary Policy?

Money is defined as anything that is generally accepted in payment for goods or services or in the repayment of debts. Money is linked to changes in economic variables that affect all of us and are important to the health of the economy. The final two parts of the book examine the role of money in the economy.

Money and Business Cycles

In 1981–1982, total production of goods and services (called **aggregate output**) in the economy fell and the number of people out of work rose to close to 12% of the labour force. After 1982, the economy began to expand rapidly, and by 1989, the **unemployment rate** (the percentage of the available labour force unemployed) had declined to 7.5%. In 1990, the eight-year expansion came to an end, and the economy began to decline again, with unemployment rising above 11%. The economy bottomed out in 1991, and the subsequent recovery has been the longest in Canadian history, with unemployment rates falling to around 6% in 2008 before rising to over 8% in early 2009 in the aftermath of the global financial crisis.

Why did the economy undergo such pronounced fluctuations? Evidence suggests that money plays an important role in generating **business cycles**, the upward and downward movement of aggregate output produced in the economy. Business cycles affect all of us in immediate and important ways. When output is rising, for example, it is easier to find a good job; when output is falling, finding a good job might be difficult. Figure 1-3 shows the movements of the rate of money growth from 1968 to 2012, with the shaded areas representing **recessions**, periods of declining aggregate output. What we see is that the rate of money growth has declined before almost every recession, indicating that changes in money might be a driving force behind business-cycle fluctuations. However, not every decline in the rate of money growth is followed by a recession.

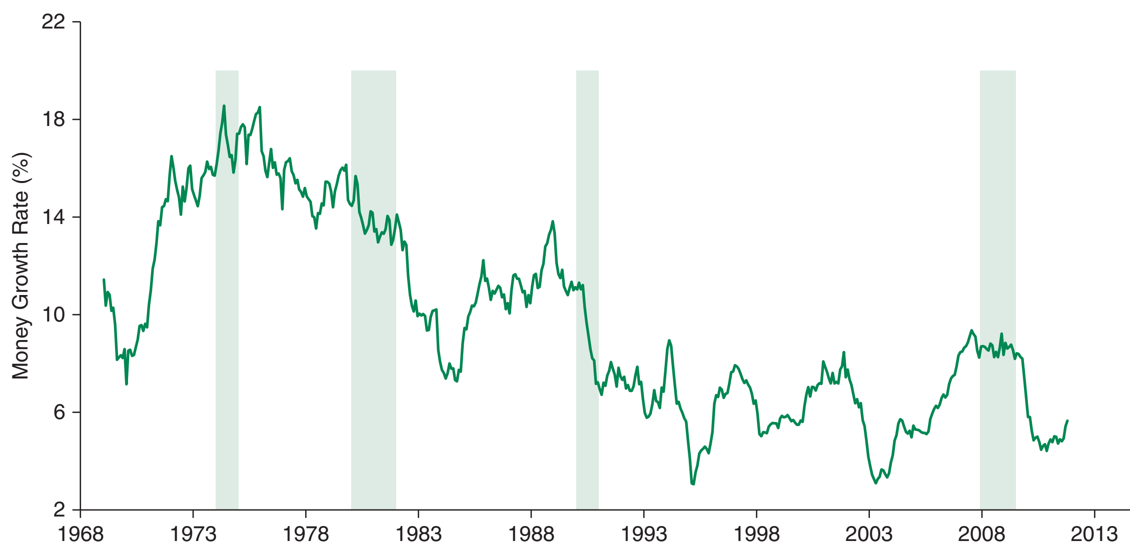
We explore how money and monetary policy might affect aggregate output in Chapters 21 through 27, where we study **monetary theory**, the theory that relates the quantity of money and monetary policy to changes in aggregate economic activity and inflation.

Money and Inflation

Twenty years ago, the movie you may have paid $13 to see last week would have set you back only a couple of dollars. In fact, for $13 you could probably have had dinner, seen the movie, and bought yourself a big bucket of hot buttered popcorn.

FIGURE 1-3 Money Growth (M2++ (Gross) Annual Rate) and the Business Cycle in Canada, 1968–2011

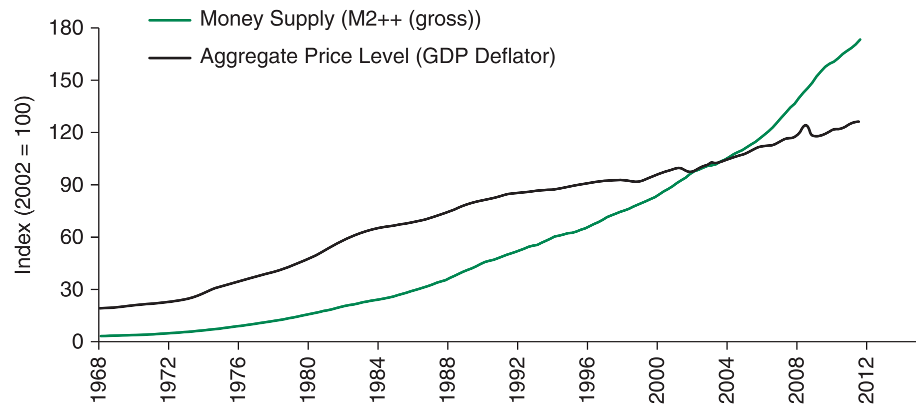
Although money growth has declined before every recession, not every decline in the rate of money growth is followed by a recession. Shaded areas represent recessions.



Source: Statistics Canada CANSIM II Series V41552801.

FIGURE 1-4 Aggregate Price Level and the Money Supply in Canada, 1968–2011

From 1960 to 2011, the price level has increased more than sixfold.



Source: Statistics Canada CANSIM II Series V1997756 and V41552801.

As shown in Figure 1-4, which illustrates the movement of average prices in the Canadian economy from 1968 to 2011, the prices of most items are quite a bit higher now. The average price of goods and services in an economy is called the **aggregate price level** or, more simply, the *price level* (a more precise definition is found in the Web Appendix to this chapter). **Inflation**, a continual increase in the price level, affects individuals, businesses, and the government. It is generally regarded as an important problem to be solved and is often at the top of political and policymaking agendas. To solve the inflation problem, we need to know something about its causes.

What explains inflation? One clue to answering this question is found in Figure 1-4. As we can see, the price level and the **money supply** generally move closely together. These data seem to indicate that a continuing increase in the money supply might be an important factor in causing the continuing increase in the price level that we call inflation.

Further evidence that inflation may be tied to continuing increases in the money supply is found in Figure 1-5. For a number of countries, it plots the average **inflation rate** (the rate of change of the price level, usually measured as a percentage change per year) from 2000 to 2010 against the average rate of money growth over the same period. As you can see, a positive association exists between inflation and the growth rate of the money supply: the countries with the highest inflation rates are also the ones with the highest money growth rates. Turkey, Ukraine, and Zambia, for example, experienced high inflation during this period, and their rates of money growth were high. By contrast, Canada, Sweden, and the United States had low inflation rates over the same period, and their rates of money growth were low. Such evidence led Milton Friedman, a Nobel laureate in economics, to make the famous statement "Inflation is always and everywhere a monetary phenomenon."[2] We look at money's role in creating inflation in Chapters 21 and 25.

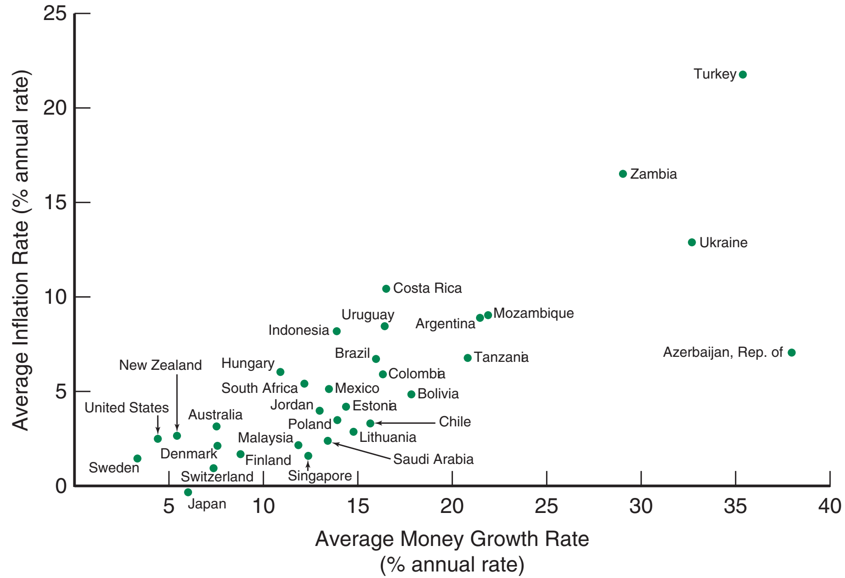
Money and Interest Rates

In addition to other factors, money plays an important role in the interest-rate fluctuations that are of such great concern to businesses and consumers. Figure 1-6 shows the changes in the interest rate on long-term Canada bonds and the rate

[2]Milton Friedman, *Dollars and Deficits* (Upper Saddle River, NJ: Prentice Hall, 1968), 39.

FIGURE 1-5 Average Inflation Rate Versus Average Rate of Money Growth for Selected Countries, 2000–2010

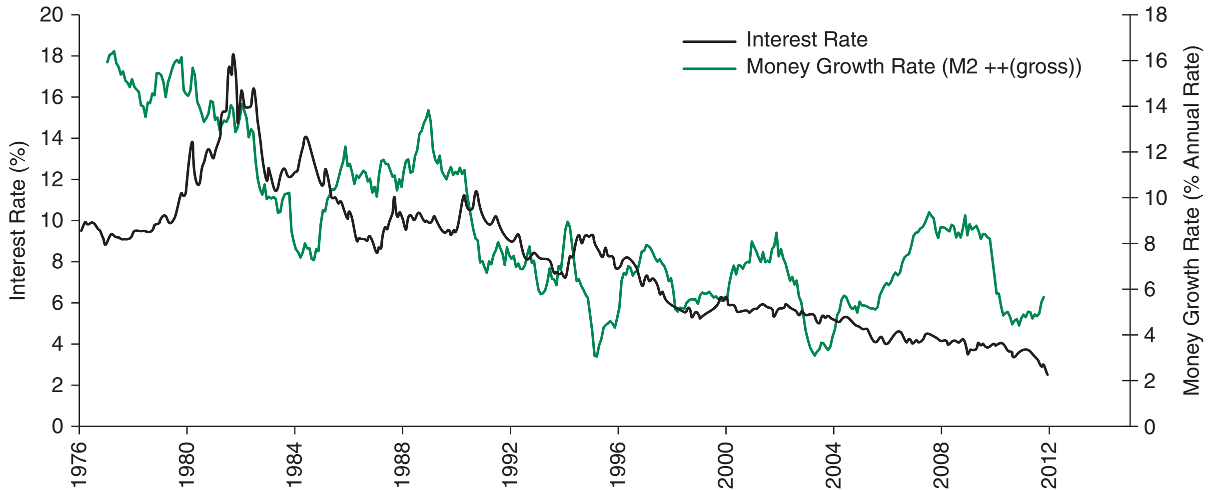
There is a positive association between the 10-year averages of inflation and the growth rate of the money supply: the countries with the highest inflation rates are also the ones with the highest money growth rates.



Source: Based on International Financial Statistics, www.imfstatistics.org/imf.

FIGURE 1-6 M2++ (Gross) Money Growth (Over 12 Months) and Interest Rates (Long-Term Government of Canada Bonds), 1977–2012

As the money growth rate fell in the 1980s and 1990s, the long-term bond rate fell with it. However, the relationship between money growth and interest rates has been less clear-cut since 2000.



Source: Statistics Canada CANSIM II Series V41552801 and V122544.