

**SECOND  
EDITION**

**FREE**  
STUDY!  
Computerized Study  
Guide Enclosed

# Financial Institutions and Markets

**Robert W. Kolb**

**Ricardo J. Rodríguez**



# Financial Institutions and Markets

*Second Edition*

**Robert W. Kolb**  
University of Miami

**Ricardo J. Rodríguez**  
University of Miami

 **BLACKWELL**  
*Business*

Copyright © Robert W. Kolb, Ricardo J. Rodríguez 1996

The right of Robert W. Kolb and Ricardo J. Rodríguez to be identified as authors of this work has been asserted in accordance with the Copyright, Designs and Patents Act 1988.

First published 1996

Blackwell Publishers, Inc.  
238 Main Street  
Cambridge, Massachusetts 02142  
USA

Blackwell Publishers Ltd.  
108 Cowley Road  
Oxford OX4 1JF  
UK

All right reserved. Except for the quotation of short passages for the purposes of criticism and review, no part may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher.

Except in the United States of America, this book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, resold, hired out, or otherwise circulated without the publisher's prior consent in any form of binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

*Library of Congress Cataloging-in-Publication Data*

Kolb, Robert W.

Financial institutions and markets / Robert W. Kolb, Ricardo J.  
Rodríguez. -- 2nd ed.

p. cm.

Includes bibliographical references and index.

ISBN 1-55786-897-2

1. Finance--United States. 2. Financial institutions--United  
States. I. Rodríguez, Ricardo J. II. Title.

HG181.K65 1996

332--dc20

95-46081

CIP

*British Library Cataloguing in Publication Data*

A CIP catalogue record for this book is available from the British Library.

Typeset in 10 point Galliard by Benchmark Productions.

Printed in the United States of America

This book is printed on acid-free paper

# Preface

*Financial Institutions and Markets, Second Edition*, provides a thorough introduction to the financial system of the United States and includes a substantial international focus as well. The text is equally suitable for a first course in finance or in a course that follows an introductory corporate finance class.

*Financial Institutions and Markets* has three special emphases that distinguish this text from its competitors. The text:

- Employs a more analytical approach
- Provides more comprehensive coverage
- Offers an unparalleled student learning package

## **A More Analytical Approach**

Many texts designed for courses on financial institutions and markets remain merely descriptive and virtually ignore the analytical and conceptual tools that constitute the foundation of the finance discipline. *Financial Institutions and Markets* consciously breaks with this non-analytical tradition. For example, Chapters 4 and 5 provide a detailed treatment of the time value of money, and they employ these fundamental concepts throughout the text: in the discussion of bond pricing, stock valuation, and option pricing, for example.

Almost all financial institutions texts discuss asset and liability management, but most offer only a purely descriptive treatment. By contrast, *Financial Institutions and Markets* explains duration, presents the formula and sample calculations, and illustrates the basic concepts with numerical examples of duration and its effect on bank balance sheets.

While the text offers a full description of institutions and markets as well, this more analytical approach pervades the entire text: from time value, to duration, to equity valuation, to cash management, to the Black-Scholes option pricing model. Throughout, the analytics are presented, discussed, and illustrated numerically.

## **More Comprehensive Coverage**

The economy relies on a financial system, but in many texts the idea of a financial system is lost, particularly because many texts omit important financial institutions and markets. For example, many texts ignore finance companies, gloss over the role of pension funds, forget insurance companies, mention financial futures and options only in passing, and appear never to have heard of the swap market.

*Financial Institutions and Markets* stands in marked contrast to these texts, with separate chapters on all these topics. For example, Chapter 22, Pension Funds, discusses the Pension Benefit Guaranty Corporation and relates its financial troubles to those that have plagued depository institutions, discussed at length in Chapter 14, Regulation of Depository Institutions. Chapter 23, The Futures Market, focuses on financial futures and stresses the no-arbitrage relationship between futures and equities and between futures and bonds. Chapter 19, Financial Conglomerates and Subsidiaries, discusses the growing role of finance companies and shows how

regulatory developments and the malaise affecting depository institutions have helped these firms enter markets formerly dominated by banks and savings and loan associations. The chapter also provides detailed discussion of specific finance companies or subsidiaries (Sears, Merrill Lynch, and General Electric) to show the wide variety of strategies and the different markets in which finance companies operate. We believe that *Financial Institutions and Markets* offers a more comprehensive and better integrated coverage of the financial system than any competing text.

### Student Learning Package

*Financial Institutions and Markets* offers a comprehensive computerized learning package for the student.

The program *STUDY!* accompanies the text and includes a bank of multiple-choice questions created specifically for *Financial Institutions and Markets*. The student begins the program by selecting any combination of chapters for study. The program loads all available questions for those chapters in a random order and begins to present them to the student. If the student answers correctly, the program updates the student's score on screen and moves to the next question. If the student's answer is wrong, the program gives the correct answer and updates the score. By using the *STUDY!* program, students can cover all of the essential conceptual issues in any set of chapters that they choose.

REALDATA, Second Edition is a collection of historical data series covering a wide range of financial institutions and markets and is available for purchase by Blackwell Publishers Inc. References to suggested REALDATA exercises are located at the end of the chapters.

### Instructor's Materials

In addition to the learning package for students, *Financial Institutions and Markets* provides extensive instructor support. The Instructor's Manual includes answers and solutions to all end-of-chapter questions and problems. The Instructor's Manual also includes a test bank for each chapter, which is also available in computerized form.

### Acknowledgments

Creating *Financial Institutions and Markets, Second Edition*, required the sustained efforts of many people. We would like to begin by thanking those who worked on the previous edition of the text: Kateri Davis, Susan Lavery, Diane Rubler, Evelyn Gosnell, Debbie MacInnes, Brian Wilson, Andrea Coens, Sandy Schroeder, and Joe Rodriguez.

We would also like to thank those who contributed to this edition, including Andrea Coens, Paul Picciak, Mary Beckwith, Mary Risso, Rolf Janke, and Jan Leahy from Blackwell Publishers, as well as Andrew Williams, Andrea Mulligan, Lissa Smith, Susan Gately, and Luminita Velicanu from Benchmark Productions.

Writing a text quickly teaches an author how much he or she must rely on others to complete a quality product. All of the people mentioned above contributed mightily to the project.

Robert W. Kolb  
Ricardo J. Rodríguez  
Miami, Florida

# Contents

---

<b>Part 1</b>	<b>The Financial System and the Economy</b>	<b>1</b>
<b>Chapter 1</b>	<b>The Role of Financial Institutions and Markets</b>	<b>3</b>
	Overview	3
	An Exchange Economy Without Money	6
	Money and Financial Investment	7
	Financial Markets and the Transformation of the Initial Endowment	8
	Real Investment and Diminishing Profits	12
	Real and Financial Investment	15
	Summary of Economies	17
	Organization of the Text	18
	Summary	23
	Questions and Problems	23
<b>Chapter 2</b>	<b>The Federal Reserve in the U.S. Economy</b>	<b>25</b>
	Overview	25
	History of the Federal Reserve System	25
	Organization of the Federal Reserve System	26
	Monetary Tools of the Fed	33
	The Fed's Balance Sheet	36
	Money and the Behavior of the Fed	36
	Summary	38
	Questions and Problems	38
	References	39
<b>Chapter 3</b>	<b>The Money Supply and Deposit Expansion</b>	<b>41</b>
	Overview	41
	The Properties of Money	41
	The Various Definitions of Money	44
	Velocity and the Demand for Money	45
	Money, Depository Institutions, and Social Welfare	46
	Money Creation and Expansion: A Simple Model	47
	Money Creation and Expansion: A Detailed Model	54

## vi Contents

Summary	59
Questions and Problems	60
Suggested REALDATA Exercises	62
References	62
<b>Chapter 4 The Time Value of Money: Single Payments</b>	<b>65</b>
Overview	65
Simple Interest	65
Compound Interest	66
Present Value and Future Value	67
Future Value and the Frequency of Compounding	68
The Effective Rate of Interest	68
Present Value	71
Solving for an Unknown Interest Rate	73
Solving for the Number of Periods	74
Summary	75
Questions and Problems	75
<b>Chapter 5 The Time Value of Money: Series of Payments</b>	<b>81</b>
Overview	81
Perpetuities	81
Annuities	82
Solving for an Unknown Interest Rate	88
Solving for an Unknown Annuity Payment	89
The Number of Periods of an Annuity	90
Valuing an Annuity Due	91
The Present Value of a Growing Perpetuity	93
The Present Value of a Growing Annuity	94
Summary	96
Questions and Problems	96
<b>Part 2 The Debt and Equity Markets</b>	<b>101</b>
<b>Chapter 6 The Money Market</b>	<b>103</b>
Overview	103
The Valuation of Debt Instruments	103
The Money Market	104
The International Money Market	114
Summary	116
Questions and Problems	116

Suggested REALDATA Exercises	117
References	117
<b>Chapter 7 The Bond Market</b>	<b>119</b>
Overview	119
The Valuation of Bonds	119
The Bond Market in the United States	123
The Corporate Bond Market	134
The Municipal Bond Market	142
The Mortgage Market	145
The Bond Contract	147
The International Bond Market	151
Summary	154
Questions and Problems	154
Suggested REALDATA Exercises	155
References	155
<b>Chapter 8 The Level and Structure of Interest Rates</b>	<b>157</b>
Overview	157
The Level of Interest Rates	158
The Term Structure of Interest Rates	163
Bond Portfolio Maturity Strategies	179
Summary	182
Questions and Problems	183
Suggested REALDATA Exercises	184
References	184
<b>Chapter 9 The Stock Market: An Overview</b>	<b>187</b>
Overview	187
Common Stock Rights and Responsibilities	187
General Organization of the Stock Market	192
The Secondary Market: The Over-the-Counter Market	202
Trading Procedures and Practices	207
The Third and Fourth Markets	213
The Brokerage Industry	214
Transaction Costs and Portfolio Management	214
Market Indexes	218
The Worldwide Stock Market	225
Summary	229



## **viii Contents**

Questions and Problems	230
Suggested REALDATA Exercises	231
References	231
<b>Chapter 10 Equity Valuation</b>	<b>233</b>
Overview	233
Preferred Stock	233
Common Stock Valuation	235
Dividends and Share Prices in the Economy	247
Risk and the Required Rate of Return	251
Summary	252
Questions and Problems	253
Suggested REALDATA Exercises	254
References	254
<b>Chapter 11 The Primary Market and Investment Banking</b>	<b>257</b>
Overview	257
The Primary Market: Size and Scope	257
The Process of Issuing Securities	261
Initial Public Offerings	268
The International Primary Market	273
Summary	274
Questions and Problems	275
Suggested REALDATA Exercises	275
References	275
<b>Chapter 12 Risk and Return in Securities Markets</b>	<b>277</b>
Overview	277
Principles of Risk and Return	277
Risk and Return in the New York Stock Exchange	281
Two-Asset Risky Portfolios	281
Multiple-Asset Portfolios	286
Introduction of the Risk-Free Asset	288
The Market Portfolio and the Separation Theorem	291
The Capital Market Line	291
Risk and Expected Return for Individual Securities	291
The Security Market Line	293
Summary	294

Questions and Problems	295
Suggested REALDATA Exercises	300
<b>Part 3 Depository Institutions</b>	<b>301</b>
<b>Chapter 13 Banks, Thrift Institutions, and Credit Unions</b>	<b>303</b>
Overview	303
The Role of Financial Intermediaries	303
Powers of Depository Institutions	309
Comparison of Activities: Banks, Thrifts, and Credit Unions	318
Summary	319
Questions and Problems	320
References	321
<b>Chapter 14 Regulation of Depository Institutions</b>	<b>323</b>
Overview	323
The Pre-Depression Framework of Banking Regulation	323
Erecting the Edifice: Post-Depression Bank Regulation	326
Disintermediation	330
The Deposit Insurance Mess	333
A New Round of Regulation	340
Measuring the Thrift Disaster	346
The Current Environment for Depository Institutions	348
The Structure of the Depository Institution Industry	349
Summary	360
Questions and Problems	360
References	362
<b>Chapter 15 Operations of Commercial Banks</b>	<b>365</b>
Overview	365
Liquidity Management	365
Cash Management	366
The Role of Banks in Delaying Payments	373
Loan Losses	383
Summary	386
Questions and Problems	387
Suggested REALDATA Exercises	389
References	389

## **x Contents**

<b>Chapter 16</b>	<b>Management of Commercial Banks</b>	<b>391</b>
	Overview	391
	Financial Statements as Managerial Tools	391
	Management of Commercial Bank Profitability	396
	Analysis of Variations	401
	Leverage, Profitability, and Risk	404
	Summary	407
	Questions and Problems	408
	References	409
<b>Chapter 17</b>	<b>Asset and Liability Management of Commercial Banks</b>	<b>411</b>
	Overview	411
	Security Pricing Principles	411
	Maturity and Security Prices	415
	The Need for a Summary Measure	417
	Duration	418
	Some Qualifications on Duration	423
	The Two Sides of Interest Rate Risk	424
	Portfolio Immunization Techniques	425
	The Funding GAP	431
	The Funding GAP and Equity Immunization	435
	Summary	437
	Questions and Problems	437
	References	439
<b>Chapter 18</b>	<b>International Banking</b>	<b>441</b>
	Overview	441
	Foreign Activities of U.S. Banks	442
	Activities of Foreign Banks in the United States	445
	International Commercial Banking	446
	International Lending	448
	Summary	453
	Questions and Problems	455
	References	456
<b>Part 4</b>	<b>Non-Depository Financial Institutions</b>	<b>459</b>
<b>Chapter 19</b>	<b>Financial Conglomerates and Subsidiaries</b>	<b>461</b>
	Overview	461
	An Overview of Finance Companies	461

Captive Finance Subsidiaries	472
Asset Securitization	476
Summary	478
Questions and Problems	478
References	479
<b>Chapter 20 Investment Companies and Performance Evaluation</b>	<b>481</b>
Overview	481
General Features of Investment Companies	482
Closed-End Investment Companies	484
Mutual Funds: Growth and Diversity	486
Regulation and Taxation of Investment Companies	491
Mutual Fund Performance	491
Methods of Performance Evaluation	493
International Investment Companies	497
Summary	500
Questions and Problems	500
Suggested REALDATA Exercises	501
References	501
<b>Chapter 21 Insurance Companies</b>	<b>503</b>
Overview	503
How Insurance Companies Benefit Society	503
Risk and Return for Insurance Companies	504
Types of Insurance Companies	507
Life Insurance Companies	508
Property and Liability Insurance Companies	516
Summary	518
Questions and Problems	519
References	520
<b>Chapter 22 Pension Funds</b>	<b>521</b>
Overview	521
The Role of Pensions	521
Types of Pension Plans	523
Management of Pension Funds	529
Regulation of Pension Funds	533

## **xii Contents**

Summary	536
Questions and Problems	536
References	537
<b>Part 5 Financial Derivatives and Risk Management</b>	<b>539</b>
<b>Chapter 23 The Futures Market</b>	<b>541</b>
Overview	541
Forward Contracts	541
The Futures Exchange	542
Futures Contracts and Futures Trading	543
Futures Pricing	551
The Social Function of Futures Markets	558
Interest Rate Futures	565
Stock Index Futures	567
Summary	569
Questions and Problems	570
References	571
<b>Chapter 24 The Options Market</b>	<b>573</b>
Overview	573
Call and Put Options	574
Option Terminology	574
Option Exchanges	575
Option Quotations	576
Option Pricing	578
Call Option Prices and Interest Rates	588
Prices of Call Options and the Riskiness of Stocks	591
Call Options as Insurance Policies	592
The Option Pricing Model	592
The Valuation of Put Options	598
Summary	605
Questions and Problems	605
References	606
<b>Chapter 25 The Swaps Market</b>	<b>609</b>
Overview	609
The Swaps Market	609
Motivations for Swaps	615

Swap Facilitators	619
Pricing of Swaps	624
Swap Portfolios	627
Summary	628
Questions and Problems	629
References	630
<b>Chapter 26    Financial Engineering</b>	<b>631</b>
Overview	631
Option Combinations	631
Synthetic Instruments	639
The Swap as a Portfolio of Forwards	643
Portfolio Insurance	644
Portfolio Insurance	646
Summary	651
Questions and Problems	652
References	653
<b>Appendices</b>	<b>655</b>
<b><i>STUDY!</i> Software Instructions</b>	<b>667</b>
<b>Index</b>	<b>673</b>

## Part 1

# The Financial System and the Economy

**Chapter 1** The Role of Financial Institutions and Markets

**Chapter 2** The Federal Reserve in the U.S. Economy

**Chapter 3** The Money Supply and Deposit Expansion

**Chapter 4** The Time Value of Money: Single Payments

**Chapter 5** The Time Value of Money: Series of Payments

Part 1 of this book introduces some of the basic concepts that are necessary to understand the behavior of financial institutions and the markets in which they operate. This foundation is laid out in the first five chapters.

Chapter 1 presents an introduction showing the benefits that a society derives from a sophisticated financial system. Starting with a simple economy with no investment and no financial system, the chapter explains how investment and the possibility of borrowing and lending make individuals better off.

In the United States, the Federal Reserve, or simply the Fed, has the functions of a central bank. As such, it is responsible for controlling the money supply and overseeing the entire financial system. Chapter 2 describes the structure and functioning of the Federal Reserve system. It also gives a brief description of the main monetary policy instruments the Fed uses to control the stock of money in the economy: required reserves, open market operations, and the discount window.

Chapter 1 introduces the concept of money in a simple “Robinson Crusoe” economy; Chapter 3 continues the study of money in a more realistic setting. For instance, concepts such as the velocity of money, the monetary base, and the money multiplier are discussed in detail. This chapter also provides a detailed explanation of how money is created by the actions of the Fed. It also shows how money is then multiplied by the actions of the entire banking system.

Chapters 4 and 5 discuss the most fundamental concept in all of finance: the time value of money. Chapter 4 concentrates on the time value of single payments. Chapter 5 builds on this foundation and discusses the time value of money of a series of payments. The chapter shows how to value annuities, perpetuities, growing annuities, growing perpetuities, and other types of cash flow streams. Knowledge of the time value of money concepts is essential in understanding many of the analytical results presented later in the book.





# The Role of Financial Institutions and Markets

---



## Overview

As we begin our study of financial institutions and financial markets, this chapter explains why they are important and how they benefit virtually all members of the economy. We begin by considering a financially primordial world – a world without money. Without money, there can be no financial assets, such as stocks or bonds, and there can be no financial investment. Investment choices are limited to real assets, such as tools and shelter, and to real investment, such as planting seed or making tools.

After examining such a primitive economy, we consider progressively more elaborate economies by allowing a richer structure of financial institutions and markets. Without question, the development of a financial system benefits society. For instance, the individual's opportunity to borrow funds against future income may improve the economic well-being of the borrower. Showing how the financial system enriches the lives of people in the economy is one of the main goals of this chapter.

If a healthy, robust, and well-developed financial system confers benefits on the members of an economy, it is certainly worth understanding. This text provides an overview of the financial system by focusing on the various financial markets and institutions and the ways they interact. This chapter concludes with a discussion of how the text is organized and the way in which it leads to an understanding of the role of the financial system in the broader economy.

## An Economy with No Exchange

The most primitive economy imaginable is one in which there is no opportunity to exchange one good for another. In Daniel Defoe's famous novel, *Robinson Crusoe* was shipwrecked on an island alone, except for his man Friday. Considering Crusoe and Friday as one economic unit, there was no possibility of exchanging one good for another, simply because there were no other economic units on the island. In this simple economy, it is obvious that there is no financial system.

Crusoe faces very few economic decisions. One of the most critical is the problem of consumption versus investment. Assume that Crusoe has some seed corn that was salvaged from the shipwreck. Crusoe and Friday may eat this corn now, store it for future consumption, or plant it to produce more corn for future consumption. Assuming that this corn is the only food Crusoe has and that it cannot be saved past next year, Crusoe must decide how much corn to consume this year and how much to save for the next period. Crusoe must consume some corn now to stay alive, so he cannot save or plant all of the corn.

Figure 1.1 shows Crusoe's consumption opportunities for this year (the current period) and for next year (the second period), assuming that Crusoe cannot plant the corn, perhaps because the island is made up of volcanic lava. Although this restriction on planting means that Crusoe's prospects for reaching old age are slim, his decision now becomes even easier. Crusoe's problem