

KIRT C. BUTLER

Third Edition

Multinational Finance



Multinational Finance

Third Edition

Kirt C. Butler

Michigan State University

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Multinational Finance, 3e

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Exchange Rate Regimes

Exchange rate regime	Africa	Asia and Pacific region	Europe	Middle East	Americas
Exchange arrangements with no separate legal tender	WAEMU: Benin*, Burkina Faso*, Ivory Coast*, Guinea-Bissau*, Mali*, Niger*, Senegal*, Togo CAEMC: Cameroon*, C. African Rep.*, Chad*, Rep. of Congo*, Equatorial Guinea, Gabon*	Kiribati, Marshall Islands, Micronesia, Palau,	Euro Area: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain San Marino, Vatican		Ecuador*, El Salvador, Panama ECCU: Antigua & Barbuda, Dominica, Grenada, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines
Currency board or fixed peg arrangements	Botswana, Cape Verde, Comoros, Djibouti*, Lesotho*, Libya, Morocco, Namibia, Seychelles, Sudan, Swaziland, Zimbabwe	Bangladesh, Bhutan, Brunei Darussalam, China, Fiji, Hong Kong, Malaysia, Maldives, Nepal, Samoa, Taiwan, Vanuatu	Bosnia-Herzegovina*, Bulgaria*, Estonia*, Latvia*, Lithuania*, Macedonia*, Malta, Turkmenistan	Bahrain, Iran, Jordan*, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria*, United Arab Emirates	Aruba, Argentina*, Belize, Bahamas, Barbados, Netherlands Antilles, Suriname
Crawling pegs or horizontal bands	Egypt	Solomon Islands, Tonga	Belarus, Cyprus, Denmark, Hungary*, Romania*	Egypt, Israel	Bolivia*, Costa Rica, Honduras*, Nicaragua*, Uruguay*, Venezuela
Managed floating with a preannounced path for exchange rates	Algeria, Angola, Burundi, Eritrea, Ethiopia*, Ghana*, Guinea*, Kenya, Mauritania*, Mauritius, Nigeria*, Rwanda, Sao Tome*, Tunisia, Zambia*	Cambodia*, India, Indonesia*, Mongolia*, Myanmar (Laos)*, Pakistan*, Singapore, Sri Lanka*, Thailand*, Vietnam*	Azerbaijan*, Croatia*, Kazakhstan*, Kyrgyzstan*, Russian Fed.*, Serbia*, Slovak Rep., Slovenia, Ukraine*, Uzbekistan, Yugoslavia	Iraq*	Dominican Rep., Guatemala, Guyana*, Jamaica*, Paraguay, Trinidad & Tobago*
Independently floating Brazil, Canada,	Dem. Rep. Congo, Gambia*, Liberia, Malawi*, Madagascar, Mozambique, Sierra Leone*, Somalia, S. Africa, Tanzania, Uganda	Afghanistan, Australia, Japan, New Zealand, Philippines*, S. Korea, Papua West Guinea	Albania, Armenia, Czech Rep., Georgia, Iceland, Moldova, Norway, Poland, Sweden, Switzerland, Tajikistan, United Kingdom	Turkey*, Yemen*	Chile, Colombia*, Haiti, Mexico, Peru*, United States

ECCU = Eastern Caribbean Currency Union. WAEMU = West African Economic and Monetary Union. CAEMC = Central African Economic and Monetary Union.

An asterisk (*) indicates that a country has an IMF-supported or similar monetary program.

Source: Compiled from *International Financial Statistics*, a publication of the International Monetary Fund (www.imf.org), April 2003 issue. Exchange rate classifications are as of December 31, 2001.

SYMBOLS AND ACRONYMS

1. Uppercase letters are used for asset prices, including currency values.
2. Lowercase letters are used for rates of change.
3. Superscripts indicate the currency units.
4. Subscripts indicate a point in time or a period of time.
5. Continuously compounded returns are in italics.
6. Return statistics are either in Greek letters or abbreviated in English (e.g., σ_j^2 or $\text{Var}(R_j)$).

P_t^d and P_t^f	Price of an asset at time t in the domestic and foreign currency, respectively
p^d and p^f	Domestic and foreign inflation (i.e. the rate of change in CPI), respectively
$S_t^{d/f}$	Spot exchange rate between currencies d (domestic) and f (foreign) at time t
$s_t^{d/f}$	Change in the spot exchange rate between currencies d and f during period t
$F_t^{d/f}$	Forward exchange rate between the domestic and foreign currencies priced at time 0 and for delivery at time t (sometimes denoted $F_{0,t}^{d/f}$)
$Fut_t^{d/f}$	Price in domestic currency of a futures contract on foreign currency priced at time 0 and for delivery at time t (sometimes denoted $Fut_{0,t}^{d/f}$)
i^d and i^f	Nominal interest rates in currencies d and f , respectively
r^d and r^f	Real interest rates in currencies d and f , respectively
$Call_t^{d/f}$	Value of a call option on foreign currency f at time t
$Put_t^{d/f}$	Value of a put option on foreign currency f at time t
$K^{d/f}$	The exercise (or striking) price of a currency call or put option
$X_t^{d/f}$	Real exchange rate at time t
$x_t^{d/f}$	Rate of change in the real exchange rate during period t
V	Value of an asset or security (e.g., $V_{\text{Firm}} = V_{\text{Debt}} + V_{\text{Equity}}$)
r_t^d and r_t^f	Rate of return during period t in currencies d and f , respectively
μ_j	Mean return on asset j
σ_j	Standard deviation of return on asset j (variance is denoted σ_j^2 or $\text{Var}(R_j)$)
$\rho_{j,k}$	Return correlation between assets j and k , such that $\rho_{j,k} = \sigma_{j,k} / (\sigma_j \sigma_k)$
$\sigma_{j,k}$	Return covariance between assets j and k , such that $\sigma_{j,k} = \rho_{j,k} \sigma_j \sigma_k$
β_j	Systematic risk of asset j (e.g., $\beta_j = \rho_{j,m}(\sigma_j / \sigma_m)$ for the one-factor market model)

Continuously compounded rates:

p	$= \ln(1+p)$	= Continuously compounded inflation
i	$= \ln(1+i)$	= Continuously compounded nominal interest rate
r	$= \ln(1+r)$	= Continuously compounded real interest rate
$s_t^{d/f}$	$= \ln(1+s_t^{d/f})$	= Continuously compounded nominal spot rate change
$x_t^{d/f}$	$= \ln(1+x_t^{d/f})$	= Continuously compounded real spot rate change

For My Family

P r e f a c e

Everything should be made as simple as possible, but not simpler.

Albert Einstein

Multinational Finance assumes the viewpoint of the financial manager of a multinational corporation with investment or financial operations in more than one country. The book provides a framework for evaluating the many opportunities, costs, and risks of multinational operations in a manner that allows readers to see beyond the algebra and terminology to general principles.

KEY FEATURES

In its third edition, *Multinational Finance* keeps the major changes that were introduced in the second edition while continuing to refine the exposition. In particular, *Multinational Finance* retains the following features.

- **An emphasis on the basics of financial management.** *Multinational Finance* emphasizes the managerial aspects of multinational finance. Intended for MBA and advanced undergraduate classes, the text requires only a single preparatory course in finance. Chapters that extend material from the first course begin with a brief review of the fundamentals. Advanced material is placed in chapter appendices so that study can be tailored to each individual's objectives.
- **A visual approach.** Graphs and figures are used to assist the reader in understanding key financial concepts and techniques.
- **Numerous real-world examples.** Real-world examples are used to illustrate how the financial concepts and techniques are used in practice.
- **A reorganized table of contents.** Instructors that adopt *Multinational Finance* typically have a professional interest in one of two related areas:
 - International financial markets
 - International corporate finance

Detailed chapters on futures, options, and swaps will satisfy those instructors who insist on including derivatives in their courses. Because some instructors prefer that these topics be covered in a separate course in financial markets, the text is written so that the derivatives chapters can be skipped without loss of continuity. Chapter 11 provides an overview and comparison of the various derivative instruments for both types of course structures.

- **Comprehensive coverage of traditional topics.** Comprehensive coverage is provided on the traditional topics of multinational finance.
 - **International financial markets.** The text presents an in-depth treatment of the international financial environment, including currency and Eurocurrency markets and the international parity conditions.
 - **Derivative securities.** The text has detailed treatments of futures, options, and swaps because of the importance of these derivative instruments in currency risk management.

- **Risk management in the multinational corporation.** Entire chapters are devoted to managing the multinational treasury and its exposures to transaction, operating, translation, and country risks.
- **Valuation and the structure of multinational operations.** Valuing and structuring the corporation's international investments is at the heart of the text. The chapter on cross-border capital budgeting has far more depth than competing texts. Entire chapters are also devoted to multinational financing, taxation, valuation, and corporate governance.
- **Distinctive chapters on key topics.** Distinctive chapters are devoted to topics of special interest to practitioners of multinational finance.
 - Chapter 9 develops the rationale for hedging currency risk.
 - Chapter 18 takes a real options approach to valuing the flexibility provided by cross-border investments.
 - Chapter 19 describes cross-border differences in corporate governance and their implications for the international market for corporate control.
 - Part Six develops the international aspects of a traditional course in investments, with separate chapters devoted to international portfolio diversification (Chapter 20), asset pricing (Chapter 21), and portfolio management (Chapter 22).

LEARNING AIDES

A number of learning aides are used to highlight the main points in each chapter.

- **Sidebar**s run in the margins and highlight key concepts and definitions.
- **Market Updates** and **Applications** appear as boxed essays that provide real-world examples and practical applications of the conceptual material.
- **Web sites** appearing in the margins link the chapter topics to the real world.
- **Key Terms** appear in boldface the first time they are used. Key terms are listed at the end of each chapter and defined in a comprehensive **Glossary** in the text.
- **Conceptual Questions** at the end of each chapter summarize the key ideas in each chapter and allow students to test their understanding of the material.
- An expanded set of end-of-chapter **Problems** provides practice in applying the financial concepts, techniques, and strategies. Solutions are provided in a *Solutions Manual* that is available to instructors adopting *Multinational Finance* for classroom use.
- **Suggested Readings** are listed at the end of each chapter and are annotated to indicate the topics addressed by the articles.

SUPPLEMENTS

A comprehensive *Instructor's Manual* is available to adopting instructors.

- More than 600 **PowerPoint** slides review the key elements in each chapter and illustrate how to apply the material. The accompanying **NotesPages** provide additional insights and examples for classroom use.
- A *Solutions Manual* provides answers to the end-of-chapter questions and problems.

- A *Test Bank* includes nearly 1,100 test questions (and solutions) including true-false and multiple-choice questions, comprehensive numerical problems, and short essays.

The objective in providing these supplements is to reduce the burden of preparation and allow instructors to spend their time where it is most needed—in teaching the students.

ACKNOWLEDGMENTS

At my karate dojo in Michigan, we begin and end each class session with the Japanese phrase “onegai shimasu,” which means “please teach me.” This is appropriate for both students and teachers. Although I have learned a great deal from my own teachers and colleagues, I have learned at least as much from my students. Their varied backgrounds and approaches to learning have enriched my life and made me a better teacher, scholar, and student.

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Professor Butler's research has appeared in a variety of academic and practitioner journals including the *Journal of Finance*, *Journal of Accounting Research*, *Financial Analysts Journal*, *Journal of Portfolio Management*, *Journal of International Money and Finance*, and the *Journal of International Business Studies*, among others. His academic research has been profiled in *Time* and *Money* magazines, on the CNN and CNBC Web sites, and elsewhere. In 2001, he won the Withrow Teacher/Scholar Award in the Eli Broad College of Business at Michigan State University.

Professor Butler is also a Sensei of Okinawan Shido-kan (Shorin Ryu) Karate, with more than 25 years of experience and a rank of sixth degree black belt.

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