FIFTH EDITION

international finance

MAURICE D. LEVI

International Finance

Fifth edition

The fifth edition of Maurice D. Levi's classic textbook has been updated to incorporate the massive changes in the world of international finance of the past few years. In particular, the emergence of new markets is given broad coverage – particularly the rise to financial prominence of China and India and other growth economies in Asia and elsewhere. Key features of the book include:

- The impact of globalization and the greater connectedness of national economies and the world economy as a whole.
- Probably the best introduction to exchange rates available and how they directly impact upon firms as well as governments.
- The continued massive impact of multinational corporations on the global financial scene as well as the opportunities presented by e-commerce.

The material is interlaced with a wealth of supplementary material including real world case studies, review questions, examples and objectives. The result is the most authoritative survey of international finance currently available.

Thoroughly updated and with a large amount of new information, this text will prove an indispensable guide to the inner workings of international finance to students of economics and business as well as professionals in the finance industry.

Maurice D. Levi is Bank of Montreal Professor of International Finance in the Sauder School of Business at the University of British Columbia, Canada.

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To Kate

"As for foreign exchange, it is almost as romantic as young love, and quite as resistant to formulae."

H. L. Mencken

(As you shall see, it is not entirely resistant to formulae!)

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About the author

Since receiving his Ph.D. from the University of Chicago, Maurice Levi has taught and written research papers in a wide variety of areas of finance and economics. This broad range of research and teaching interests form the foundation for this book on international finance, a subject that he believes to be best treated as an application of financial and economic principles, rather than as a separate and isolated subject area.

Professor Levi has published research papers on financial market anomalies, the effectiveness of monetary and fiscal policy, the relationship between inflation and interest rates, the effect of taxes on international capital flows, and the link between inflationary expectations and unemployment, as well as in numerous areas of international finance that are reflected in this book. He has also written in the areas of econometric methods, macroeconomics, labor economics, environmental economics, money and banking, and regional economics. His papers have appeared in just about every leading research journal in finance and economics, including: *American Economic Review*; *Econometrica*; *Journal of Political Economy*; *Journal of Finance*; *Journal of Monetary Economics*; *Journal of Money*, *Credit and Banking*; *Journal of International Money and Finance*; *Journal of International Economics*; *Review of International Economics*; *Management Science*; *Ecological Economics*; and *Journal of Econometrics*. He is also the author of *Economics and the Modern World* (Heath, Lexington, MA, 1994), *Economics Deciphered: A Layman's Survival Guide* (Basic Books, New York, 1981), and *Thinking Economically* (Basic Books, New York, 1985), and the coauthor, with M. Kupferman, of *Slowth* (Wiley, New York, 1980).

Since joining the Sauder School of Business of the University of British Columbia, Professor Levi has held visiting positions at the Hebrew University of Jerusalem, the University of California, Berkeley, MIT, the National Bureau of Economic Research, the University of Exeter, University of New South Wales, and the London Business School. He has received numerous academic prizes and awards including Killam and Nomura Fellowships and the Bronfman Award.

Preface

This book is intended for use in business and economics courses in international finance at the masters or senior-undergraduate level. It is comprehensive, covering the financial markets, economic environment and management of multinational business. It is designed to be used in its entirety in courses that cover all areas of international finance, or selectively in courses dealing with only the financial markets and economic environment, or the financial management of multinational business. To facilitate the selective use of the book in the two major subdivisions of international finance, this fifth edition is divided into two self-contained segments.

The book is specifically designed for students who have taken introductory economics and finance, and who wish to build upon the basic economic and financial principles they have acquired. By assuming these fundamental prerequisites, this book is able to go further than competing texts in international finance. It is able to introduce the student to the new and exciting discoveries and developments in this dynamic and rapidly expanding field. These discoveries and developments, many of which have occurred during the last few years, are extensions of the principles of finance and economics.

With a growing component of commerce taking on international proportions, an increasing number of students have more than an academic interest in the subjects they take. After graduation, many will find they need to apply directly what they have learned. Consequently, a good textbook in international finance must cover practical managerial topics such as how to evaluate foreign investment opportunities, where to borrow and invest, how exchange rates affect cash flows, how to measure foreign exchange exposure and risk, what can be done to avoid exposure and risk, and the general financial management problems of doing business in the global environment. However, even these highly practical topics can be properly dealt with only by applying basic economic and financial principles that many other international finance textbooks appear reluctant to employ. As a result, despite adequate levels of preparation, the student often receives a rather shallow treatment of international financial applications that fails to build on the foundations of previous courses. For this reason, many senior-undergraduate- and masters-level students with solid backgrounds in, for example, the consequences of arbitrage or the principles of capital budgeting feel they stop short of the frontiers of international finance.

This book represents a major revision and updating of the fourth edition of *International Finance*. In the fourth edition a large amount of material on the international financial environment was covered separately in three lengthy chapters at the very end of the book. Only two short chapters on the balance of payments and on the simple supply and demand view of exchange rates were included early in the book. This meant that such matters as modern theories of the determination of exchange rates and the evolution of the international financial system were split into two disconnected parts. Instructors wanting to cover, for example, the case for fixed versus flexible exchange rates or the conditions for success of a common currency had to jump

between chapters. In response to requests by several instructors who preferred the organization in earlier editions of this book, all the material on the "big picture" of the international financial environment has been grouped together in one integrated section. This section now also includes a chapter on open economy macroeconomics that discusses the effectiveness of monetary and fiscal policy under fixed and flexible exchange rates. This international environment section comes after the markets have been discussed and before the section on the financial management of multinational business. However, care has been taken so that in courses taking a managerial finance perspective, all or part of the section on the international financial environment can be skipped without loss of continuity.

As with previous editions, a substantial revision has been necessary because the international financial developments that are occurring are nothing short of spectacular. For example, new markets and instruments are emerging at a frantic pace, in part as a response to exchange rates that at times have been so volatile they have grabbed the headlines, not of the business section of the newspaper, but of the front page. The day-to-day lives of people have been affected by events such as the introduction of the euro which represents an unprecedented experiment in international financial cooperation, and the emergence of new economic superpowers such as China and India. Liquidity crises such as that associated with the sub-prime mortgage situation have been linked to huge changes in exchange rates. Great fortunes have been made and lost in foreign exchange. News reports have also been full of exchange rate crises, and economic summits dealing with the architecture of the international economic system. At the same time, there has been an explosion of research in international finance. The revisions in this fifth edition of *International Finance* reflect the important recent developments and research that have sharpened the insights from studying this dynamic subject.

This book has evolved over a number of years while teaching or doing research at the Sauder School of Business at the University of British Columbia and also at the Hebrew University, Jerusalem; the University of California, Berkeley; the Massachusetts Institute of Technology; the London Business School; the University of New South Wales; and the University of Exeter. I am indebted to all these institutions, especially the Sauder School of Business, which has been my home base for over three decades.

An author's debts are a pleasure to acknowledge, and in the course of five editions of this book I have incurred many I would find difficult to repay. A large debt is owed to my colleague Ali Lazrak, who has provided valuable comments. The help offered by reviewers has also been immensely important in improving the final product. Only the anonymity of the individual reviews prevents me from apportioning the vast credit due to them. My wife, Kate, sons Adam and Jonathan, and daughter Naomi have provided professional and indispensable help in preparing the manuscript. Too numerous to mention individually but of great importance were the students in my MBA and undergraduate courses in international finance at the University of British Columbia, whose reactions have been a crucial ingredient in the revision of this text.

It is to my wife, Kate, that I owe my greatest thanks. In addition to playing a vital role in preparing and checking the manuscript she has provided the moral support and encouragement that have made this fifth venture a generally agreeable task.

Maurice Levi
Vancouver, B.C.

Part I

International financial markets
and environment

Chapter 1

The world of international finance

The globe is not a level playing field.

Anonymous

UNIQUE DIMENSIONS OF INTERNATIONAL FINANCE

While tradition dictates that we continue to refer to the subject matter in this book as *international* finance, the modifier "international" is becoming increasingly redundant: today, with fewer and fewer barriers to international trade and financial flows, and with communications technology directly linking every major financial center, all finance is becoming "international." Indeed, not only are domestic financial markets increasingly internationally integrated, but the problems faced by companies and individuals in different lands are remarkably similar.

Even though most if not all finance must be viewed at the international level, there are special problems that arise from financial and trading relations between nations. These are the problems addressed in this book. Many of these problems are due to the use of different currencies used in different countries and the consequent need to exchange them. The rates of exchange between currencies – the amount of a currency received for another – have been set by a variety of arrangements, with the rates of exchange as well as the arrangements themselves subject to change. Movements in exchange rates between currencies can have profound effects on sales, costs, profits, asset and liability values, and individual well-being. Other special, uniquely international financial problems arise from the fact that there are political divisions as well as currency divisions between countries. In particular, the world is divided into nation states that generally, but not always, correspond to the currency divisions: some nations share currencies, such as the **euro** that is the common currency for numerous European nations, and the Russian ruble that is used in Russia as well as some former Soviet states. Political barriers provide additional opportunities and risks when engaging in overseas borrowing and investment. International finance has as its focus the problems managers face from these currency and country divisions and the associated opportunities and risks.

THE BENEFITS OF STUDYING INTERNATIONAL FINANCE

Knowledge of international finance can help a financial manager consider how international events may affect a firm and what steps can be taken to exploit positive developments and insulate the firm from harmful ones. Among the events that affect the firm and that must be managed are changes in exchange rates as well as interest rates, inflation rates, and asset values. These different changes are themselves related. For example, declining exchange rates tend to be associated with relatively high interest rates

and inflation. Furthermore, some asset prices are positively affected by a declining currency, such as stock prices of export-oriented companies that are more profitable after devaluation. Other asset prices are negatively affected, such as stock prices of companies with foreign-currency denominated debt that lose when the company's home currency declines: the company's debt is increased in terms of domestic currency. These connections between exchange rates, asset and liability values and so on mean that foreign exchange does not simply add an extra exposure and risk to other business exposures and risks. Instead, the amount of exposure and risk depends crucially on the way exchange rates and other financial prices are connected. For example, effects on investors in foreign countries when exchange rates change depend on whether asset values measured in foreign currency move in the same direction as the exchange rate, thereby reinforcing each other, or in opposite directions, thereby offsetting each other. Only by studying international finance can a manager understand matters such as these. International finance is not just finance with an extra cause of uncertainty. It is a legitimate subject of its own, with its own risks and ways of managing them.

There are other reasons to study international finance beyond learning how exchange rates affect asset prices, profits and other effects described above. Because of the integration of financial markets, events in distant lands, whether they involve changes in the prices of oil and gold, election results, the outbreak of war, or the establishment of peace, have effects that instantly reverberate around the Earth. The consequences of events in the stock markets and interest rates of one country immediately show up around the globe, which has become an increasingly integrated and interdependent financial environment. The links between money and capital markets have become so close as to make it futile to concentrate on any individual part.

In this book we are concerned with the problems faced by any country or any firm whose performance is affected by developments in the international environment. Our analysis is relevant to more than the newly emerging industrial economies such as China and India that have grown through exports, or the giant multinational corporations (MNCs) that have received so much attention in the media for the power that they wield. It is also relevant to the multitude of companies that have explored international opportunities by forming joint ventures outside their own borders. Indeed, it is just as valid for countries and companies with a predominantly domestic focus that happen to export a little of their output or to buy inputs from abroad. Even countries and companies that are domestically focused but compete with firms producing abroad and selling in their local markets are affected by international developments. For example, Chinese auto-part or appliance manufacturers with no overseas sales will find home country sales and profit margins affected by exchange rates which influence the home currency prices of imported auto parts and appliances: an appreciation of the Chinese currency lowers prices of products imported into China. Similarly, bond investors holding their *own* government's bonds, denominated in their *own* currency, and spending all their money at *home*, are affected by changes in exchange rates if exchange rates prompt changes in interest rates. Specifically, if governments increase interest rates to defend their currencies when their currencies fall in value on the foreign exchange markets, holders of domestic bonds will find their assets falling in value along with their home currencies: bond prices fall when interest rates increase. It is difficult to think of any firm or country that is not affected in some way or other by the international financial environment. Inflation, jobs, economic growth rates, bond and stock prices, oil and food prices, government revenues and other important financial variables are all tied to exchange rates and other developments in the increasingly integrated, global financial environment.

THE GROWING IMPORTANCE OF INTERNATIONAL FINANCE

The international flows of goods, services and capital that are the source of supply of and demand for currencies, and hence essential to the subject of

international finance, are also fundamental to our well-being. A strong currency, for example, *ceteris paribus*, improves a country's standard of living: the country's currency buys more in world markets. Not only does a strong currency allow citizens to buy more imports; they can also buy more domestically produced products that are internationally traded. This is because a country's citizens have to compete with foreigners for their own country's internationally tradable products. The gain in standard of living from a rising currency is also evident when living standards are compared between nations. International rankings of living standards require conversions of local-currency incomes into a common measure, usually the US dollar. *Ceteris paribus*, a rising currency moves a country up the standard of living ladder by making local currency incomes worth more US dollars.

Citizens also gain from the efficient global allocation of capital: when capital is allocated to its best uses on a global scale overall returns are higher, and these extra returns can be shared among the global investors. Let us therefore pause to consider the evidence for growth in the international movement of goods and capital. We shall also describe the sources of gains from the flows of goods and capital. We shall see that international finance is a subject of immense and growing importance.

The growth of international trade

International trade has a pervasive importance for our standard of living and our daily lives. In the stores and malls we find cars from Japan, cameras and electrical equipment from China, LCD and plasma TVs from Korea, and clothing from India. On the street, automobiles assembled in Germany, Mexico, Canada, Sweden, and France burn gasoline from Nigeria, Saudi Arabia, Great Britain, Iran, and Kuwait. At home we drink tea from India, coffee from Brazil, whisky from Scotland, beer from Germany, and wine from just about every corner of the Earth. We have become so used to enjoying these products from distant lands that it is easy to forget they are the result of international trading and the financial linkages discussed in this book.

Record on the growth of trade

Peoples and nations have been trading from time immemorial. During the period since records have been kept the amount of this trade between nations has typically grown at a faster rate than has domestic commerce. For example, since 1950, world trade has grown by about 6 percent per annum, roughly twice that of world output over the same period. During the nineteenth century, international trade grew at such a tremendous rate that it increased by a factor of 25 times in the century leading up to World War I. Even in the period since 1970, a mere moment in the long history of international trade, the value of trade between nations has expanded by a factor of 35 times, with global trade now close to 30 percent of global GDP: see Table 1.1. Trade has been extremely important for the economic development of the newly industrialized Asian economies: see Table 1.2. Many of these countries have assembled imported components of products, and then re-exported the

Table 1.1 *Aggregate international trade versus GDP: billions US dollars*

Year	*Global GDP*	*Global imports*	*Imports/ GDP percent*
1970	3,370.0	392.0	11.6
1975	6,253.7	1,064.2	17.0
1980	11,755.5	2,381.4	20.3
1985	12,888.1	2,338.1	18.1
1990	22,679.9	4,285.8	18.9
1995	29,302.8	6,199.8	21.2
2000	31,546.1	7,830.4	24.8
2005	43,886.0	12,509.3	28.5
2006	45,941.8	13,506.7	29.4

Note
More and more of what we purchase comes from abroad, and hence from the other perspective, more and more of what we make goes abroad.

Source: World Economic Outlook Database: WEO Aggregates, International Monetary Fund, 2007: <http://www.imf.org/external/ns/cs.aspx?id=29>

Table 1.2 *International trade of newly industrialized Asian economies: billions US dollars and relevant percents*

Year	*Combined GDP*	*Combined imports*	*Imports/GDP percent*	*Combined exports*	*Exports/GDP percent*
1980	145.92	100.4	69	92.0	63
1985	211.66	119.1	56	130.5	62
1990	536.76	305.3	57	316.7	59
1995	1008.00	636.8	63	638.1	63
2000	1077.83	743.5	70	794.4	74
2005	1419.37	1089.1	77	1165.6	82
2006	1513.58	1205.4	80	1282.8	85

Note
Imports and exports form a very large fraction of GDP for the newly industrialized economies because they import and then re-export many goods. Only the value added from re-exported products contributes to the countries' GDPs.

Source: World Economic Outlook Database: WEO Aggregates, International Monetary Fund, 2007: <http://www.imf.org/external/ns/cs.aspx?id=29>

finished products. As a result, they frequently have trade deficits with the countries supplying components for assembly, and trade surpluses with countries to which they ship the assembled products. The contribution to the industrializing economies' Gross Domestic Products (GDPs) is only the value added by assembling the products, not the value of exports. This explains the high ratios of import and export trade to GDP seen in Table 1.2. Countries buying the finished products, particularly the United States and Western Europe, have frequently complained about the deficits they have been running with the industrializing Asian economies. The developing economies have pointed out that their overall trade balances do not invariably exhibit surpluses, with the positive trade balances with countries buying the finished products being partially or even completely offset by deficits with the countries supplying components for assembly, such as Japan and Korea, which ship components for assembly in China.

International trade data are not only distorted by **re-exports**. For example, there have been years when the world's combined reported imports exceeded global exports. In the absence of extraterrestrial trade, this suggests a reporting or computational error: when properly calculated, global imports must equal global exports. The mechanisms for reporting imports are generally considered better than those for reporting exports: governments keep track of imports for collection of duties and for health and safety reasons. Yet, despite the problems with the accuracy of trade data, there has been no shortage of trade disputes that make reference to these data. Measurement errors, however, are clearly not responsible for the rapid relative and absolute growth in international trade. Why is it that international trade, and all the international financial activity associated with that trade, has grown so rapidly?

Reasons for the growing importance of international trade

There are two principal reasons why international trade has grown so rapidly:

1 A liberalization of trade and investment via reductions in tariffs, quotas, currency controls and

other impediments to the international flow of goods and capital.

2 An unprecedented shrinkage of "economic space" via rapid improvements in communication and transportation technologies, and consequent reductions in costs.

Much of the trade liberalization has come from the development of free trade areas such as that of the **European Union (EU)**, now consisting of well over two dozen countries from Sweden to Malta and Portugal to Greece, and that of the United States, Canada and Mexico, which signed the **North America Free Trade Agreement (NAFTA)** in 1993. Similarly, rapid growth of trade has occurred among the members of the **Association of South East Asian Nations (ASEAN)**. Indeed, ever more global trade is occurring within trading blocs. This regionalization of trade has important currency implications, making the trend of paramount importance to international finance. For example, the euro has become the common currency of many of the members of the European Union, motivated by the desire to reduce the foreign exchange risks and currency conversion costs of doing business within this important **customs union.**[1] The previous currencies of this area have completely disappeared: no more German mark, Italian lira and so on. This has reduced foreign exchange conversions compared to what they would have been without the euro. The same type of reduction would occur should there ever be a North American common currency emerging out of what so far has been only a free-trade arrangement.

The second factor contributing to growing trade, namely the shrinkage of "economic space" caused by a lower cost of communication and transportation, has had a profound effect. For example, in real terms, long-distance telephone costs have been reduced by more than 95 percent since the 1920s. Connection times have been reduced even more dramatically: long distance calls used to be connected manually by operators who would route calls through available trunk lines.[2] The cost of international business travel by air has dropped so substantially that it can cost little more for a US executive to meet with an Asian or European client than with another US executive in another US city. Air freight and ocean tanker costs for transporting goods have also generally declined. This has resulted in a **globalization** of markets and consequent rapid growth in international financial activity for settling transactions on the multinational scale.

Given the growing importance of international trade, it is worth briefly considering the rewards and risks that accompany it. This will allow us to introduce some of the matters discussed at length later in this book.

The rewards of international trade

The principal reward of international trade is that it has brought about increased prosperity by allowing nations to specialize in producing those goods and services at which they are relatively efficient. The relative efficiency of a country in producing a particular product can be described in terms of the amounts of other, alternative products that could be produced by the same inputs. In other words, we can think of relative efficiencies in terms of the opportunity cost of one product in terms of another product. When considered in this way, relative efficiencies are described as **comparative advantages**. All nations can and do simultaneously gain from exploiting their comparative advantages, as well as from the larger-scale production and broader choice of

1 A customs union is different from a free-trade area. A customs union maintains common levels of tariffs and other trade restrictions against non-members while having free trade between the union members. A free-trade area allows countries to maintain different tariffs and other trade restrictions against non-members. This limits the ability of goods and services to move freely between members of a free-trade area: countries must check when products move across borders to see if they are produced by member countries or by non-member countries.

2 See Ronald Abler, "Effect of Space-Adjusting Technologies on the Human Geography of the Future," in *Human Geography in a Shrinking World*, Ronald Abler, Donald Janelle, Allen Philbrick and John Sommer (eds), Duxberg Press, North Scituate, MA, 1975, pp. 35–56.

products that are made possible by international trade.[3]

In the last few years it has become increasingly recognized that there is more to successful international trade than comparative advantages based on productive efficiencies.[4] These particular advantages cannot explain distinct patterns of success, such as Singapore's or Ireland's rapid economic growth with limited resources, versus Argentina's and much of Africa's slow economic advance despite abundant natural advantages. Also, comparative advantages do not explain why some regions *within* countries, such as northern Italy or greater Mumbai, grow faster than other regions, or why parts of industries expand while others contract. Dynamic factors, rather than static production efficiencies and "factor endowments," play a vital role in international trading success by offering countries what Michael Porter refers to as **competitive advantages**.[5] One important factor of success involves the fact that countries are typically successful internationally in products for which there are dynamic, discerning buyers at home. For example, the French success in wine and cheese, German success in beer and finely engineered automobiles, British success in cookies, Italian success in fashion, and US success in entertainment are all in part due to the presence of consumers in the respective countries whose sophisticated tastes have forced firms to produce first-class products to maintain their markets. Once successful at home, these firms have been able to succeed abroad.

A further factor affecting success in international trade is the presence of suppliers and firms in supportive industries in the vicinity of exporting firms. For example, in southern California the US entertainment industry can call on lighting and camera engineers, actors and scene designers, and even such "extras" as exotic animal trainers and pyrotechnics experts. Other so-called "**clusters**" of supportive activities are found in the northern German chemical industry, Mid-Western US automobile industry, northern Italian manufacturing industry, and the Tokyo–Osaka-based consumer-electronics sector.

The risks of international trade

The rewards of trade do not come without accompanying risks. The most obvious additional risk of international versus domestic trade arises from uncertainty about exchange rates. Unexpected changes in exchange rates have important impacts on sales, prices and profits of exporters and importers. For example, if a Scottish whisky exporter faces an unexpected increase in the value of the pound from \$1.8/£ to \$2.0/£, a bottle of whisky sold for £10 will increase in price in the United States from \$18 to \$20. This will reduce sales, and if the Scottish exporter keeps the price at £10 before and after the change in the exchange rate, it reduces that exporter's revenue and profit.[6] Similarly, prices, sales, revenue and profits of importers are also affected by unexpected changes in exchange rates.

Tables 1.3 and 1.4 provide some examples of companies whose profits have been affected by changes in exchange rates. The examples indicate that effects can be substantial viewed both absolutely and relative to net income. For example, in Table 1.3 some companies, such as the Ford Motor Company, made foreign exchange gains while making losses overall. Table 1.4 shows that foreign exchange losses can be substantial. The power of exchange rates to affect the bottom line and even the survival of companies is also illustrated in Exhibit 1.1.

3 For those who have not learned or have forgotten the principle of comparative advantage, a summary is given in Appendix A at the end of this chapter. The gains from exploitation of comparative advantage are no different from the gains from specialization *within* a country.

4 This recognition is in large part due to the influential book by Michael E. Porter, *The Competitive Advantage of Nations*, Harvard University Press, Cambridge, MA, 1989.

5 *Ibid*.

6 In our whisky example, the dollar price might in reality increase by less than the change in the exchange rate. As we shall show in Chapter 14, the amount of "pass through" of changes in exchange rates reaching the buyer depends on the elasticity of demand, use of internationally tradable inputs, flexibility of production, and so on.

Table 1.3 *Selected foreign exchange gains, 2001: millions of US dollars*

Company	*Country*	*Gain*	*Net Inc. (Loss)*	*Fx. Gain(%)*	*Industry*
Citicorp	USA	2,383	9,642	25	Banking/Finance
Barclays	UK	1,470	3,585	41	Banking/Finance
Deutsche Bank	Germany	1,233	149	828	Banking/Finance
UBS	Swiss.	1,232	2,996	41	Banking/Finance
HSBC	UK/HK	600	5,406	11	Banking/Finance
Ford Motors	USA	283	(5,453)	n/d	Auto Manufacture
IBM	USA	198	7,723	3	Computing
Chevron/Texaco	USA	191	3,288	6	Energy
Deutsche Telekom	Germany	178	(3,074)	n/d	Telecommunications
Telefonos De Mex.	Mexico	127	2,566	5	Telecommunications
Rio Tinto	UK	58	1,079	5	Mining
China Petroleum	China	45	1,936	2	Mining
Inco	Canada	39	305	13	Mining
Xerox	USA	29	(71)	n/d	Business Equipment
BHP Billiton	Australia	29	1,348	2	Mining
China Eastern	China	15	65	23	Airlines
Apple	USA	15	(25)	n/d	Computing
Canadian Pacific	Canada	9	258	4	Railway
Nortel	Canada	9	(27,446)	n/d	Telecommunications

Note
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Source: COMPUSTAT, 2003

Whether changes in exchange rates affect prices, sales, and profits of exporters, importers, and **import competers** depends on whether changes in exchange rates really make a firm's goods cheaper or more expensive to buyers.[7] For example, if a decrease in the value of the British pound from $2.0/£ to $1.8/£ occurs while the price of a bottle of whisky for export from Scotland goes from £10 to £11.11, a bottle of whisky will continue to cost $20 in the United States. This is because the pound price multiplied by the exchange rate, which gives the dollar price, is unchanged. Our example shows that in order to determine the effect of a change in exchange rates on a *company*, we must examine product prices and how product prices and exchange rates are related. The effect of a change in exchange rates on a *country* depends on how inflation and exchange rates are related. We see that we must study international

7 As we shall see when discussing operating exposure in Chapter 14, companies competing with imported goods in their home market, known as import competers, are affected by exchange rates in the same way as exporters: they gain from depreciation and lose from appreciation of their home currency.

Table 1.4 *Selected foreign exchange losses, 2001: millions of US dollars*

Company	*Country*	*Loss*	*Net Inc. (Loss)*	*Industry*
Telefonica	Spain	697	1,875	Telecommunications
Koninklijke	Holland	279	984	Publishing
Sony	Japan	239	115	Music/Electronics
United Pan Europe	Holland	153	(3,935)	Communications
Turkcell Iletisim	Turkey	151	(187)	Telecommunications
United Global	USA	148	(4,494)	Communications
Exxon Mobil	USA	142	15,320	Energy
General Motors	USA	107	601	Transport Manufacture
Portugal Telecom	Portugal	106	273	Telecommunications
Alcatel	France	105	4,418	Telecommunications
Alberta Energy	Canada	71	517	Energy
Lucent	USA	58	(16,198)	Telecommunications
BASF	Germany	56	5,214	Chemical
Bell Canada	Canada	39	235	Telecommunications
Pfizer	USA	33	7,788	Pharmaceuticals
Monsanto	USA	32	5,462	Agricultural Supply
Abbot	USA	31	16,285	Health
Shell	UK/Holland	30	135,211	Energy
Dow Chemical	USA	24	27,805	Chemical

Note
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Source: COMPUSTAT, 2003

finance at the level of the economy as well as at the level of the firm.

The risk faced by exporters, importers, and companies competing with imports resulting from the impact of exchange rates on prices, sales, and profits is only one of the additional risks of international trade versus domestic trade. Another risk of international trade is **country risk**. This includes the risk that, as a result of war, revolution, or other political or social events, a firm may not be paid for its exports: many exporters extend trade credit to buyers. Country risk applies to foreign investment as well as to credit granted in trade, and exists because it is difficult to use legal channels to reclaim assets when the investment is in another political jurisdiction. Furthermore, foreign companies may be willing but unable to pay because, for example, their government unexpectedly imposes currency exchange restrictions. Other country-related risks of doing business abroad include uncertainty about the possible imposition or change of import tariffs or quotas, possible changes in subsidization of local producers, and possible imposition of non-tariff barriers such as quality requirements that are really designed to give domestic firms an advantage.

EXHIBIT 1.1 CURRENCY MATTERS: CORPORATE EXPERIENCES

News reports over the years have been full of accounts of companies that have suffered huge losses or enjoyed great gains from exchange-rate movements. The very fact that foreign exchange losses and gains frequently make the business headlines is proof in itself that companies have not hedged their foreign exchange exposure, or if they have hedged, that the hedges have been incorrectly designed.* Consider, for example, the following reports that span more than twenty years:

- In 1985, the same year that Volkswagen produced its 50 millionth car, the company found itself apparently defrauded to the tune of nearly half a billion Deutschmarks. At the time this was equivalent to approximately a quarter of a billion dollars. The problem was that the US dollar fell well below what it could have been sold for, and as required by company policy, by using an appropriate foreign exchange contract. The foreign exchange loss that ensued was enough to wipe out the profit from a calendar quarter of global operations.
- In the case of BOC, a British producer of gases for industry, a foreign exchange gain of nearly 17 million pounds was made by using a foreign exchange contract to sell the entire year's revenues for 1985 at a substantially higher price than would have been received by selling the foreign exchange as it was received.
- The US photographic company, Eastman-Kodak, estimated that in the few years leading up to 1985, the strong US dollar cost the company $3.5 billion in before-tax earnings. Subsequent weakening of the dollar helped reverse the losses, showing that failure to hedge fully may or may not be harmful.
- In 1986, Japan's largest camera producer reported a more than two-thirds reduction in profit attributed to a strong Japanese yen.
- More recently, Japan's Toyota Motors has benefited from a weak yen which has allowed it to catch and even overhaul General Motors' sales by 2007. As well as facilitating competitive gains in market share, the weaker yen has contributed to translation gains due to the fact that a weak yen means more yen received from its foreign currency revenue.†

(It is worth mentioning that in the case of Volkswagen, the apparent fraud was the result of a failure of managers in charge of reducing the company's foreign exchange risk – or more precisely its "exposure," a term we define later – to take the steps they were supposed to. Indeed, it was claimed that forged documents were used to hide the absence of the appropriate steps. The Volkswagen experience is a vivid example of how costly it can be not to apply some of the principles in this book, even though in Volkswagen's case top management knew very well what was supposed to be done. Indeed, Volkswagen had very strict rules that all foreign exchange exposure be hedged. Unfortunately, those responsible for putting the rules into effect ignored top management's instructions.)

* Hedging is action taken to reduce foreign-exchange exposure, and is discussed later at length, especially in Chapters 15–18.

† See <http://www.bloomberg.com/apps/news?pid=20670001&refer=asia&sid=apnzTq7x.R4k>.

Source: Based on information in "Companies and Currencies: Payment by Lottery," *The Economist*, April 4, 1987, p. 8, and "Ex-VW Official is Arrested in Fraud Case," *Wall Street Journal*, April 8, 1987, p. 27.

Practices have evolved and markets have developed which help firms cope with many of the added risks of doing business abroad. For example, special types of foreign exchange contracts have been designed to enable importers and exporters to **hedge**, or **cover**, some or all of the risks from unexpected changes in exchange rates. Similarly, **export credit insurance** and **letters of credit** have been developed to reduce risks of non-payment when granting trade credit to foreign buyers. With international

trade playing a growing role in just about every nation, it is increasingly important that we learn about the risk-reducing instruments and practices. We must also learn about the fundamental causes of the special risks of international trade. These are two important topics of this book.

Increased globalization of financial and real-asset markets

Alongside the growing importance of international trade, there has been a parallel growth in the importance of foreign investment in the money market, the bond market, the stock market, the real-estate market, and the market for operating businesses.[8] At times, the importance of overseas investments and investors has swelled to overshadow that of domestic investments and investors. For example, there have been periods when purchases of US bills and bonds by Japanese, Chinese, German, and other foreign investors have exceeded purchases of these instruments by Americans. Foreign buyers can be so crucial to the successful sale of securities that the US Treasury and private brokerage firms must watch overseas calendars to ensure they do not launch a major sale when, for example, Japanese or European financial institutions are closed for an official holiday. The horizons of investors and borrowers have clearly become global. Mergers and acquisitions, whether by private equity investors or public companies, are just as likely to involve foreign as domestic entities. In catering to the expanding horizons of investors and borrowers, there has been an explosion of internationally oriented financial products, such as internationally diversified, global, and single foreign country mutual funds. The popularity of these products is a sign of the widening internationalization of financial markets.

Mutual funds that are called **international funds** are those with foreign but no US component. **Global funds** are those that include US as well as foreign assets. Funds referred to as **emerging-country funds** hold assets from smaller economies such as Thailand, Turkey, Malaysia, the Philippines, Romania, and Indonesia. The buying of foreign securities directly by individuals without the use of mutual funds has also enjoyed rapid growth. Real-estate and other markets have also experienced transformations from the phenomenal pace of globalization. However, as with the expansion of international trade, the increased globalization of investment has brought both rewards and risks. These are evident in the large gains and large losses that have been made, depending on the timing and locations of investments.[9]

The growth in globalization of investment viewed from a US perspective can be seen in Figure 1.1. Since the mid-1970s Americans have increased their investments abroad by more than ten times. During this same period, foreigners increased their investments in the United States by almost twenty times. As a consequence, the United States has gone from being the world's largest net creditor to the largest debtor in only a quarter of a century. Without access to foreign funds the United States would have had great difficulty funding its many financial needs, largely due to the low savings rate of Americans. The price, however, has been a need to make debt service payments that has reduced the fraction of the US national product enjoyed by Americans.

Rewards of globalization of investment

Among the rewards of the globalization of investment has been an improvement in the efficiency of the global allocation of capital and an enhanced ability to diversify investment portfolios. The efficiency gain from the better allocation of capital arises from the fact that international investment reduces the extent to which investments with high returns in some countries are forgone for want of available capital, while low-return investments in other

8 Some measures of globalization of financial markets are provided in Exhibit 1.2.

9 The dependence of returns on the timing and location of investment is dramatically illustrated in Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, Princeton, N.J., 2002.

EXHIBIT 1.2 GETTING A GRIP ON GLOBALIZATION

After asking the question "What does 'globalization' mean?" *The Economist* provides an answer which motivates a substantial part of the topic selection for this book, namely: "The term can happily accommodate all manner of things: expanding international trade, the growth of multinational business, the rise in international joint ventures and increasing interdependence through capital flows – to name but a few."*

We have spoken in the text about the expansion of international trade, which has generally grown faster than the global economy and which now represents almost a third of global GDP. Interestingly, trade declined relatively to global GDP during the first half of the twentieth century after reaching an extremely high level in 1914. World Wars I and II, and the Great Depression that is bracketed by them, all worked to reduce international economic interdependence, and so it might be claimed that we have been enjoying a renewed globalization rather than some unprecedented enhanced integration of the world's economies.

As for the growth of multinational business, globalization might be measured by the extent to which a bigger proportion of what we buy is produced by fewer corporate entities. For example, we might measure the extent of globalization by how much of the global GDP is attributable to the production of the world's largest 100 (or perhaps 500) companies. However, since GDP measures only the value added by different companies, we cannot simply take the total sales of the companies as a measure of their combined contribution to global GDP: some companies' outputs are other companies' inputs. For example, energy companies and steel companies sell to manufacturing companies, so we cannot count the energy and steel that is produced as well as the manufactured goods that are produced: we would be double counting the energy and steel. Nevertheless, there is little doubt that there has been a growth in importance of multinational enterprises in the world economy. This is evident from the number of large mergers and acquisitions (M&As) that have occurred, many of which have spanned national boundaries.

The Economist also mentions the number of joint ventures as an aspect of globalization. In China, for example, much of the early industrial expansion took the form of joint ventures with well-established Western companies such as Volkswagen and General Motors. These joint ventures have been financed by massive foreign direct investments. It is hard to miss the globalization that has occurred as we witness the same products and the same stores wherever we travel.

As for the increasing interdependence through international capital flows mentioned by *The Economist*, we can measure globalization by the extent to which we are increasingly subject to the same economic forces wherever we live. Stock markets across the globe, for example, move up and down at more or less the same time. Indeed, we no longer live in a world where the flow is always from financial markets in the rich industrialized countries to those of the emerging economies. For example, on Tuesday, February 27, 2007 there was a sudden and major drop in the Chinese stock markets in Shanghai and Shenzhen which reverberated around the world. This was a stark recognition that not only are we increasingly connected in this globalizing world, but at the same time the balance of economic influence is shifting to emerging economies such as China and India. Their thirst for materials and capital has resulted in them becoming critical components in the new global economy.

* "Fear of Finance," in *World Economy*, a supplement in *The Economist*, September 19, 1992, p. 1.

countries with abundant capital go ahead. The flow of capital between countries moves marginal rates of return in different locations closer together, thereby offering investors at home and abroad overall better returns. There is an additional gain from increased international capital flows enjoyed via an enhanced ability to smooth consumption over time by international lending and borrowing: countries

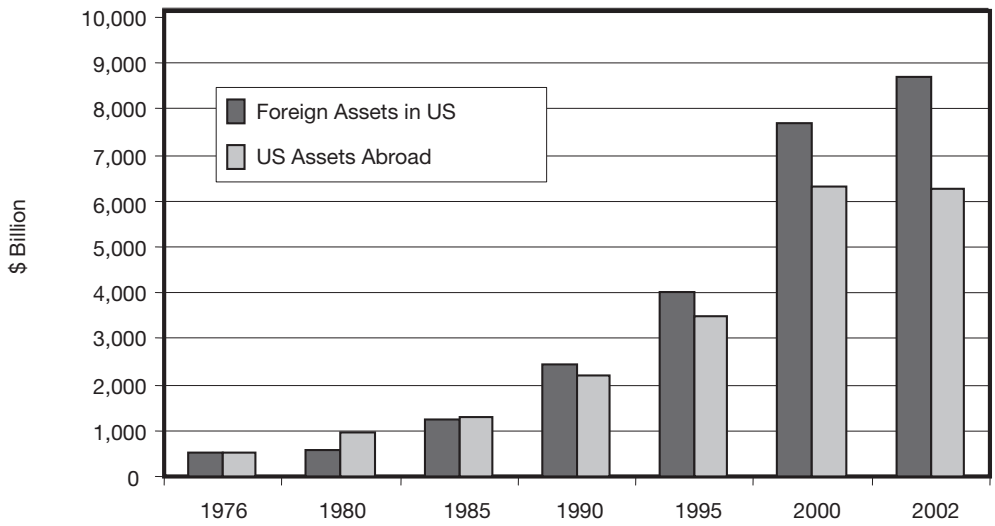

Figure 1.1 *International investment position of the United States*

Note
In the mid-1980s the United States switched from being an international net creditor nation to an international net debtor. By the new millennium this net debt position had grown to over two trillion dollars.

Source: Survey of Current Business, US Department of Commerce, Office of Business Economics, 2003

can borrow abroad during bad years and pay back in good years. The analytical basis of the gain from consumption smoothing along with the gain from a better international allocation of capital are described in Appendix B.

Cost of globalization of investment

The benefits of the globalization of investment have incurred a price: the addition of exchange-rate risk and country risk.

Unanticipated changes in exchange rates cause uncertainty in home-currency values of assets and liabilities. For example, if the exchange rate is $2 per British pound, i.e. $2/£, a bank balance of £100 in London is worth $200 to a US investor. If the British pound unexpectedly falls in value to $1.5, the US investor's bank balance falls in value to $150. If instead of having an asset the US investor had a debt or liability of £100, the unexpected change in exchange rate from $2/£ to $1.5/£ means a reduction in the dollar value of what the American owes. The dollar value of the liability will decline from $200 to $150.

In the case of a foreign-currency-denominated bank balance or debt, exchange-rate risk is due solely to uncertainty in the future exchange rates at which the asset or liability will be **translated** into US dollars. In the case of many other assets and liabilities, exchange rate risk is due both to uncertainty in the exchange rate to be used for translation *and* to variations in local-currency values that may be affected by exchange rates: home-currency values of foreign stocks, bonds, and property are affected by exchange rates. However, as we shall see later, the mere fact that an asset or liability is in a foreign country does not mean that it is subject to exchange-rate risk, and the mere fact that an asset or liability is at home does not mean it is immune from exchange-rate risk.[10]

10 The surprising fact that foreign assets may not be exposed to exchange-rate exposure while domestic assets may be exposed is explained in Chapter 13.

Table 1.5 *The volatility of exchange rates*

	Volatility %						
Period	*UK*	*FR*	*GER*	*ITALY*	*CAN*	*JAP*	*EURO*
1999–2002	5	8*	8*	8*	3	7	8
1990–1998	7	7	8	14	9	14	—
1980–1989	18	22	19	21	6	24	—
1970–1979	14	10	22	17	6	16	—
1960–1969	7	3	2	0	3	0	—
1957–1959	0	14	0	0	1	0	—

Note
* Coefficient of variation of euro

Source: Standard deviation of month-end-to-month-end exchange rates, divided by the mean exchange rate over the period 1957–2002 (*International Financial Statistics*, International Monetary Fund, Washington, D.C., 2003)

Accompanying the increased exchange-rate risk associated with the globalization of investment is the risk from increasing interdependence between different countries' financial markets: by markets moving up and down together, diversification gains from global investment are diminished. There have been numerous examples of this interdependence in recent years. For example, the **Asian Crisis** of 1997–1998 began in Thailand, but it quickly spread to South Korea, Malaysia, Taiwan, the Philippines, and Indonesia. Fear of the impact of massive drops in the values of Asian currencies on the competitiveness of other trading nations spilled over to Argentina, Brazil, and eventually even to markets in Europe and North America. The process of spreading crises through the interconnectedness of financial markets became widely referred to as **contagion**.

The globalization of investment has not only meant increased importance of foreign exchange risk. The increase in ownership of foreign assets has also meant that investors face increased country risk. As we have mentioned, country risk involves the possibility of expropriation or confiscation of financial assets or real property, or destruction of value by war or revolution. It also involves the possibility of changes in taxes on income earned by foreigners, and the imposition of restrictions on repatriating income. As in the case of foreign exchange risk, this book shows how practices and institutions have evolved to help investors reduce country risk.

Increased volatility of exchange rates

The more rapid growth of international trade versus domestic trade and the expanded international focus of investment that we have described offer more than adequate reasons why it is increasingly important for students of business to study international finance. There is, however, an additional reason why knowledge of this exciting discipline has become imperative.

Exchange-rate risk has at times risen even more than the amount of foreign trade and overseas investment because of exchange-rate volatility. This volatility is described in Table 1.5, which shows the **coefficient of variation** of some major currencies.[11]

Exchange-rate volatility has been so substantial that at times the plight of the dollar, or the soaring or sinking value of some other major currency, has

11 The coefficient of variation is the standard deviation divided by the mean. It is a measure of volatility that can be compared over time and across counties.

become headline material even outside of the business press. Prompted at times by political tensions and at other times by news on the economic health or malaise of some major country, exchange rates have sometimes jumped and dropped by startling amounts. Billions of dollars – and yen, euros, pounds, and francs – are made and lost in a day as a result of these currency swings. Rarely before have exchange rates darted around as much as they have in recent years, and therefore never before has exchange-rate risk and exposure been so important to measure and manage. If we add to the higher volatility the fact that international trade and investment are both far more important than they used to be, we can see why it has become so essential to understand the nature of exchange-rate risk and how to manage it.

There is no consensus as to why exchange rates have been so volatile. Some blame the switch to flexible exchange rates that occurred around 1973. However, others say the previous fixed exchange-rate system could not have coped with the larger shocks that have occurred since that time: jumps and drops in oil prices, international conflicts, acts of terrorism, and so on. What is fairly certain is that the increased globalization of investment played a role by being associated with more **hot money** skipping from financial center to financial center in search of the highest return or a safe haven. Another factor may have been the advances in technology for moving money and transmitting information, which have allowed both to move at the speed of light. Whatever the reason, a consequence of the greatly increased exchange-rate volatility has been a parallel increase in the importance of understanding the methods of managing foreign exchange risk, and the other topics covered in this book.

Increased importance of multinational corporations and transnational alliances

In addition to the growth of international trade and investment flows, and the riskiness of international trade and investment due to country risk and the volatility of exchange rates, interest in international finance has grown with the increased importance of **multinational corporations**. While the multinationalization of business is no easier to measure with a unique number than globalization of financial markets, corporate investment across borders, which is the essence of corporations becoming multinational, has at times grown four times faster than global output and three times faster than international trade.[12] The United Nations estimates that there are more than 35,000 multinational corporations, with the largest 100 of these possibly being responsible for approximately 16 percent of the world's productive assets. The power held by these massive, effectively stateless enterprises has long been a source of governmental and public concern. The fear has been that by extending their activity they could influence governments and exploit workers and consumers, especially in smaller nations that might control fewer resources than the mega-corporations themselves. Indeed, concern over the extension of control by foreign multinationals has been voiced even in the world's largest economy, the United States.

Concern has been expressed about the dominance of multinationals in international trade.[13] According to the US Bureau of Economic Analysis, US-based multinationals were associated with 80 percent of US exports and 40 percent of imports. Because of their importance, we shall discuss multinationals both from the perspective of why they have grown in relative importance, and whether there really is any reason for concern. This is done in Chapter 20. We shall also discuss **transnational alliances**, which consist of separately owned corporations in different countries working in cooperation: multinational corporations are commonly owned business operations in different countries. Let us briefly review how the discussion of multinationals and transnationals fits with other topics in this book before beginning an exploration of the world of international finance.

12 See "Multinationals: A Survey," in *The Economist*, March 27, 1993, p. 5.

13 See F. Steb Hipple, "The Measurement of International Trade Related to Multinational Companies," *American Economic Review*, December 1990, pp. 1263–1270.

TOPICS COVERED IN THIS BOOK

The book is divided into two parts, Part One consisting of a treatment of the international financial environment in which business operates, and Part Two consisting of the treatment of international financial management in that environment.

The first segment of Part One, Section I, consisting of Chapters 2, 3 and 4, describes the organization of foreign exchange markets. An introduction to the structure of the markets and the form in which currencies are exchanged is essential background to the study of international financial management. Chapter 2 explains the nature of the bank-note and bank-draft markets, the former involving the paper currency in our wallets and the latter involving checks. It is shown, for example, that the ability to choose direct or indirect exchange between any pair of currencies allows us to compute all exchange rates from exchange rates of each currency vis-à-vis the US dollar or some other base currency. Transaction costs are shown to cloud the link between currencies.

Chapter 3 turns to the so-called "forward exchange market" and explains how it works. This is the market in which it is possible to contract for future sale or purchase of a foreign currency so as to avoid being affected by unanticipated changes in exchange rates. Chapter 4 introduces two other instruments for reducing risk associated with exchange rates, namely currency futures and options. We explain their similarities and differences as well as the organizational structure of the markets in which these instruments trade. Chapter 4 includes an appendix describing the so-called "put–call forward parity," showing how arbitrage ensures an equivalence between buying a European call option and selling a European put option on a foreign currency on the one hand, and a forward purchase of the currency at the strike price on the other hand. (A European option gives the buyers the right to buy ("call") or sell ("put") the foreign currency at a stated strike price on the day the option expires.)

Section II, consisting of Chapters 5 and 6, presents the two fundamental principles of international finance: the **purchasing-power parity (PPP) principle** and the **covered interest parity principle**. The PPP principle states that exchange rates should reflect the relative local-currency prices of baskets of products in different countries, and that changes in exchange rates reflect differences in countries' inflation rates; according to PPP, countries with relatively rapid inflation should have depreciating currencies, and vice versa. Chapter 5 examines both the theory behind the PPP condition and its empirical validity. The principle used to explain the PPP condition in Chapter 5 is **arbitrage**, whereby prices in different countries are moved towards equality by the choice of which country's goods to purchase.[14]

Chapter 6 is devoted to the covered interest parity condition. This condition states that when exchange-rate risk is avoided by using forward exchange contracts, investment yields and borrowing costs are the same in different currencies. If there really were no differences in investment yields and borrowing costs between currencies, it would not matter in which currency investment or borrowing occurred. However, there *are* differences in investment yields and borrowing costs, and the reasons why they exist are explained in Chapter 6. It is important that we understand why these yield and borrowing-cost differences occur because they have implications for international cash management.

Section III, consisting of Chapters 7, 8 and 9, deals with the determination of exchange rates. The purpose of these three chapters is to give the reader an understanding of the fundamentals of why exchange rates move up and down when they are free to change, as they are under the system of flexible exchange rates. Such an understanding is essential for successful financial management in today's international financial environment.

Chapter 7 looks at the structure and meaning of the balance-of-payments account, where the factors behind the supply of and demand for a country's currency are recorded. Indeed, the balance-of-payments

14 Arbitrage is typically described in terms of prices being pulled together by buying in one location and selling in another. More correctly, this is two-way arbitrage and is more roundabout than the one-way arbitrage used to explain PPP in this book.

account is viewed as a record of the causes of the supply of and demand for a currency. Chapter 8 examines the supply-and-demand curves for currencies and the nature of the exchange-rate equilibrium they determine. It is shown that there is a real possibility that the exchange-rate equilibrium is unstable, meaning that small movements from equilibrium exchange rates can result in large movements from equilibrium. This possibility is related to a phenomenon known as the J-curve, whereby changes in exchange rates have unexpected effects. For example, it is shown that a depreciating currency – a currency with a falling foreign exchange value – can actually make a country's balance of trade worse. (Normally, one would think depreciation of a country's currency would improve its trade balance.)

Chapter 9, which is self-contained and which can therefore be omitted without loss of continuity, considers some theories of exchange rates that go beyond the standard flow supply and demand exchange-rate model, where by "flow" we mean currency demand and supply from such things as exports, imports, and capital flows between nations. These amounts are so much per period of time. Instead, these alternative theories are based on the *stocks* of different countries' currencies – which are the countries' money supplies – and the demands to hold these stocks, as well as on the stocks of other assets such as bonds. The simplest of these stock-based theories is the Monetary Theory of Exchange Rates. According to the Monetary Theory, exchange rates are determined according to the supply versus the demand for one currency versus another currency. If the supply of one currency is increased relative to the demand for that currency by more than the supply of a second currency is increased relative to demand for the second currency, the first currency will decline in value. Depreciation becomes a function of too rapid an increase in money supply vis-à-vis demand in one country versus another country. An attribute of this theory is that it can be extended to include demand for a currency by foreigners as well as citizens.

Chapter 9 also describes an extension of the assets for which supply equals demand to include bonds as well as money. This is the Portfolio Balance Theory. The implications of the Monetary and Portfolio Balance theories differ qualitatively when it comes to certain factors from the simple flow theory involving imports, exports, and capital flows. Other predictions, while qualitatively the same, differ quantitatively.

Chapter 9 concludes with theories of exchange-rate volatility. The explanations for volatility include the possibility that exchange rates will systematically overshoot if some prices, usually considered to be those of non-traded goods, are "sticky," meaning they do not change easily.

Section IV, consisting of Chapters 10, 11 and 12, is devoted to further aspects of the global financial market beyond the fundamentals covered in Section III. The entire section is self-contained and can be omitted without loss of continuity.

Chapter 10 describes a variety of international financial systems based on fixed exchange rates – rates set and maintained or at least influenced by the intervention of central banks or so-called "currency boards." While it is less important to study fixed exchange rates today than when the exchange rates of almost all major currencies were formally fixed, we should pay some attention to issues concerning fixed exchange rates because the international financial system has moved away from complete flexibility in exchange rates since 1985. Furthermore, fixed rates still exist in a number of countries. For example, the value of the Hong Kong dollar has been pegged to the US dollar since the 1980s, and the Chinese yuan, also called the "people's money," or RMB, is subject to the influence of the People's Bank of China. It is also possible that the international financial system could some day return to fixed exchange rates.

The discussion of fixed rates involves descriptions of the now-defunct gold standard, the Bretton Woods System, **target zones** (which are bands within which governments try to maintain exchange rates, the **European Monetary System**, and the advent of the new common currency of a number of members of the European Union, the euro. This leads us into a discussion of the automatic adjustment mechanisms which help to correct payment imbalances between countries, especially the mechanism involving the price level.

Chapter 11 takes a look at the past, present, and possible futures of the international financial system. One thing that becomes clear as we review how the historical architecture of the international financial system has evolved over time is that the system is subject to change, usually in response to currency crises. It is hard to believe we have reached the "end of history," having written the final chapter on this important economic arrangement. If anything remains the same, it is that the exchange-rate architecture is subject to periodic redesign.

In Chapter 11 we consider many of the serious crises that have at times threatened the normal conduct of international business, including the Argentinian Crisis and Asian Crisis. In the course of considering the possible future evolution of the international financial system, we consider the pros and cons of fixed and flexible exchange rates, and the international financial institutions charged with charting the course through trade imbalances, mounting debts, and fundamental shifts in global economic power.

Chapter 12 concludes the first of the two major parts of the book, that concerned with the international financial environment. This chapter covers the essentials of open-economy macroeconomic policy, opening with a brief introduction to a framework that has been used to achieve numerous insights about the efficacy of open-economy macroeconomic policy, the *IS, LM* model, augmented with the *BB* curve. We explain the slopes and shifts of these relationships that describe equilibrium in the goods (*IS*), money (*LM*), and foreign exchange (*BB*) markets. Once explained, the *IS, LM, BB* model is used to show that fiscal policy – involving taxes and government spending – is more effective than monetary policy in a fixed exchange-rate environment, while monetary policy – involving money supply or interest rates – is more effective than fiscal policy with flexible exchange rates. The effectiveness of devaluation and tariff policy is shown to depend on whether there is full employment. Chapter 12 also considers the resolution of macroeconomic policy conflicts such as occur when there is a trade deficit – which would normally suggest contractionary policy – and unemployment – which would normally suggest expansionary policy. The resolution involves assignment of policies designed to exploit the comparative advantages of monetary and fiscal policy. A geometrical description of the resolution of the "assignment problem" developed by Robert Mundell is presented in an appendix.

Part Two, the second of the two major divisions of the book, is concerned with international financial *management*. This part begins with Section V, consisting of Chapters 13 and 14, which consider foreign exchange risk and exposure.

Chapter 13 focuses on the definition and measurement of foreign exchange exposure, which is the amount at risk to changes in exchange rates. The definition we use is that exposure is the sensitivity of domestic currency values of assets, liabilities, or operating incomes to changes in exchange rates. Different types of exposure, and the factors determining the size of each type of exposure, are described. We explain that exposure is found virtually everywhere. For example, companies that do not export or import and have no foreign currency debts or assets may be exposed. This may occur if they compete at home with foreign firms whose share of a company's market depends on exchange rates. Alternatively, companies that supply exporters and importers are exposed to exchange rates through effects on derived demand. Even holders of domestic currency bonds who consume only domestic non-tradable goods can be exposed if central banks follow a policy of "leaning against the wind," raising interest rates in the face of a weakening currency: bond prices decline in such circumstances causing losses on domestic currency bonds when the country's currency depreciates. On the other hand, investors in foreign assets may *not* be exposed if the asset prices move in the exact opposite direction to exchange rates: in such a case their value in domestic currency is unaffected by exchange rates. In addition, in Chapter 13 exchange-rate *exposure* is carefully distinguished from exchange-rate *risk*. Risk is due to unanticipated changes in exchange rates. We show that risk requires exposure, but exposure does not necessarily involve risk.

Most discussions of the effects of exchange rates emphasize the gains or losses on assets or liabilities, not the effects on a firm's ongoing profitability of its operations. However, as international trade grows and companies' competitors are increasingly foreign, exchange rates are having ever larger effects on operations. Chapter 14 deals with the important matter of operating exposure by applying the standard tools of microeconomics. These tools are applied to discover the factors that influence how product prices, sales, production costs, and profits of exporters, importers, and import competers are affected by changes in exchange rates. A geometrical approach is taken that employs the familiar marginal cost, marginal revenue description of the theory of the firm.

Section VI, consisting of Chapters 15 and 16, deals with the issues of hedging and speculation, which themselves are closely related: currency speculation can be passive, involving a failure to hedge exposure. Chapter 15 starts out by addressing the question of whether managers should take steps to reduce the amount that is exposed to risk from unanticipated changes in exchange rates, or whether they should leave hedging to individual shareholders. While shareholder-level hedging has some advantages, especially if different shareholders have different perspectives of what constitutes a hedge, several possible valid reasons for managerial hedging are discussed. Also, the consequences of different hedging techniques are compared. These include forward, futures, and options contracts, as well as swaps. The simple graphical technique of **payoff profiles** that has become commonplace in **financial engineering** is used to compare the consequences of different hedging techniques.

Chapter 16 considers the extent to which foreign exchange markets reflect available information, and the closely connected question of whether it is possible to profit from currency speculation. This leads into a discussion of exchange-rate forecasting and the record of attempts to forecast exchange rates and to profit from such forecasts.

Chapters 17 to 21, which make up Section VII, examine international investment and the financing of that investment. In Chapter 17 the section begins with a discussion of short-term cash management and why a multinational corporation might want to centralize the management of its working capital. It is shown that the same factors that might cause differences in investment yields and borrowing costs between currencies described in Chapter 6 are the factors which must be considered in cash management. Chapter 18 deals with portfolio investment, and explains how investors can choose between investments in different countries' stock and bond markets. Attention is paid to the benefits of an internationally diversified portfolio of securities. It is shown that because economic conditions do not move in a perfectly parallel fashion in different countries, it pays to diversify internationally. The theory of and evidence for whether securities are priced in an internationally integrated or a segmented market setting are examined within the context of the capital asset pricing model, CAPM.

Chapters 19 and 20 focus on foreign direct investment, FDI, which is what occurs when, for example, a company builds a manufacturing plant in another country. Chapter 19 shows how to evaluate foreign direct investments, including the discount rate and tax rate to employ, the way to handle favorable financing terms offered to investing companies by foreign governments, restrictions on repatriating income, and so on. This involves the application of the principles of capital budgeting to the international context. Chapter 20 looks at the factors behind the growth of the giant multinational corporations (MNCs) which have been the result of foreign direct investment. It also considers problems caused by the growth of MNCs, and how costs and earnings are allocated among divisions of an MNC by internal transfer prices for items exchanged between corporate divisions. Since a primary concern of MNCs is country risk which involves the possibility of foreign facilities being seized or of taxes being imposed or changed on repatriated earnings, Chapter 20 looks at the measurement and avoidance of country risk. Associations between corporations in different countries, forming so-called transnational corporations, are one such means of reducing country risk and so are also discussed in Chapter 20.

Chapter 21 is concerned with the financing of overseas investment. It covers equities, bonds, bank and government lending, and the choices between them that result in alternative possible financial structures, including the question of whether overseas subsidiaries should follow parent company financing practices or those in the overseas destination of investment.

The final section of the book, Section VIII, considers the institutional structure of international trade and finance. We begin with a discussion of the important role played by commercial banks. Today, large commercial banks offer deposits and make loans in a variety of currencies other than the currency of the country in which they are located. Such deposits and loans are called **offshore currencies**, of which **Eurodollars** are the best-known example. Chapter 22 explains why the offshore currency market has developed, and how it works. This leads naturally into a discussion of international banking. We explain the organizational structure of international banking, including the reasons why banks are among the largest multinational corporations that exist, sometimes having an office or other presence in a hundred countries.

As well as covering trade financing, Chapter 23 looks at the practical side of exporting and importing. It describes the documents that are involved in international trade, the methods of insuring trade, and so on. Among the matters discussed are letters of credit and bills of exchange. Because a substantial part of international trade takes a special form known as countertrade, which involves circumventing the normal use of currency in the exchange of goods and services, an account is also given of the nature of and possible reasons for this practice.

The preceding overview of the contents of this book, along with the earlier parts of this chapter, indicate the broad range of increasingly important issues addressed in this most globalized of all subject areas of business: international finance. Having sketched the main features of the world we are to explore, let us begin our journey with a tour of the fascinating markets for foreign exchange.

SUMMARY

1. Every good or service reaching us from abroad has involved international finance. Knowledge of the subject can help managers avoid harmful effects of international events and possibly even to profit from these events.
2. International trade has grown approximately twice as fast as domestic trade. The increased relative importance of international trade has brought rewards and costs.
3. The principal reward from international trade is the gain in standard of living it has permitted. This gain comes from exploiting relative efficiencies of production in different countries and the exploitation of competitive advantages.
4. The costs of international trade are the introduction of exchange-rate risk and country risk. Methods and markets have evolved that allow firms to avoid or reduce these risks, and since international trade has become more important it has become more important to learn about these methods and markets.
5. International finance has also become a more important subject because of an increased globalization of financial markets. The benefits of the increased flow of capital between nations include a more efficient international allocation of capital and greater opportunities for countries and their citizens to diversify risk. However, globalization of investment has meant new risks and increased interdependence of financial and economic conditions between different countries.
6. Adding to the increase in relevance of exchange-rate risk from the growth in international trade and the globalization of financial markets has been an increase in the volatility of exchange rates and a growth in the importance of multinational corporations and joint ventures. All of these factors combine to make it imperative that today's student of business studies the factors behind the risks of international trade and investment, and the methods of reducing these risks.

REVIEW QUESTIONS

1. How might you measure growth in the relative importance of international trade in recent decades?
2. Why has international trade grown more rapidly than domestic trade?
3. What is a "comparative advantage"?
4. What helps provide a "competitive advantage"?
5. What is "country risk"?
6. What does it mean to "hedge"?
7. What are the principal benefits of international investment?
8. What are the principal costs of international investment?
9. What is "hot money"?
10. What is the difference between a multinational corporation and a transnational corporation?

ASSIGNMENT PROBLEMS

1. In what ways might the following be affected by sudden, unexpected changes in exchange rates?
   a An American holder of US Treasury bonds

b An American holder of GM stock
c An American on vacation in Mexico
d An American holder of Honda stock
e A Canadian on vacation in the United States

2. What is meant by "shrinkage of economic space"?
3. What are the possible implications of adoption of a common currency such as the euro?
4. What competitive advantages may be behind the success of a particular industry in international trade?
5. Why have some governments been concerned with the growing importance of multinational corporations?

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APPENDIX A

The gains from trade in goods and services: the principle of comparative advantage

Comparative advantage is not the most intuitive concept in economics, and it can require concrete demonstrations to leave the reader convinced of why countries gain from exploiting their comparative advantages. Discovered by the English stockbroker-millionaire David Ricardo, an understanding of comparative advantage helps answer the following question:

> Suppose that China is much more efficient than the United States in producing steel and marginally more efficient than the United States in producing food, and that steel and food are the only items produced and required in both countries. Would both countries be better off from free trade between them than by prohibiting trade?

When faced with this question, some people might say that China would be better off from free trade because it is more efficient at producing both products, while the United States would be worse off. The reasoning behind this view is the presumption that China would be able to undercut US prices for both products and thereby put Americans out of work. What the principle of comparative advantage shows is that in fact *both* countries are better off from free trade than no trade, even if one of the countries is less efficient at producing everything. It shows that it is *relative* efficiencies rather than *absolute* efficiencies of production that determine the benefits of trade. These relative efficiencies of production are referred to as comparative advantages. Let us explain this important principle of comparative advantage by an example, which will also clarify what we mean by this concept.

Suppose that the amounts of labor needed to produce a ton of steel and food in the United States and China with the given stocks of land and capital devoted to these products are as shown at the top of Table 1A.1. These numbers

Table 1A.1 *The situation with no international trade*

Output	*US*	*China*
	Number of people employed per ton of output	
Food	25	20
Steel	10	4
	Opportunity cost per ton of output	
Food	2.5 tons steel	5.0 tons steel
Steel	0.4 tons food	0.2 tons food
	Millions of people employed	
Food	75	40
Steel	75	40
	Outputs, millions of tons	
Food	3	2
Steel	7.5	10

assume that China can produce both products with less labor than the United States, which means that China has an **absolute advantage** in both products. (Of course, the assumption is made simply to provide an example.)

If the United States were to produce one more ton of food by moving labor from producing steel, the forgone output of steel – that is, the opportunity cost of food in terms of steel – would be 2.5 tons of steel.[15] On the other hand, if the United States were to produce one more ton of steel by moving labor from producing food, the opportunity cost would be 0.4 tons of food. Similarly, in China the opportunity cost of one more ton of food is 5.0 tons of steel, and the opportunity cost of one more ton of steel is 0.2 tons of food. These numbers are shown in Table 1A.1. We see that the United States has a lower opportunity cost of producing food, while China has a lower opportunity cost of producing steel. These relative opportunity costs are the basis of the definition of comparative advantage.

A comparative advantage in a particular product is said to exist if, in producing more of that product, a country has a lower opportunity cost in terms of alternative products than the opportunity cost of that product in other countries. Table 1A.1 shows that the United States has a comparative advantage in producing food and China has a comparative advantage in producing steel. It should be clear that as long as relative efficiencies differ, every country has some comparative advantage. This is the case even if a country has an absolute disadvantage in every product. What we will demonstrate next is that by producing the good for which the country has a comparative advantage (lower opportunity cost) and trading it for the products for which other countries have a comparative advantage (lower opportunity cost), *everybody* is better off.

Table 1A.1 shows the number of workers (available labor power) shared by the two industries in the United States and China. The table also gives the outputs of food and steel in each country, assuming half of the relevant working populations in each country is employed in each industry. For example, 75 million Americans can produce 3 million tons of food when 25 workers are required per ton, and the other 75 million who work can produce 7.5 million tons of steel. The total world output of food is 5 million tons, and the total world output of steel is 17.5 million tons.

Suppose now that 28 million Chinese workers are shifted from agriculture to steel, while at the same time 50 million American workers are shifted from steel to agriculture. The effect of this on the outputs of both countries is shown in Table 1A.2. We find that with China emphasizing steel production and with the United States emphasizing food, the outputs for the two countries combined are 5.6 million tons of food and 19.5 million tons of steel. The combined outputs of both items have increased by 10 percent or more merely by having China concentrate on its comparative advantage (steel) and the United States concentrate on its comparative advantage (food).

The United States and China can both be richer if they trade certain amounts between themselves. One such trading division would be for the United States to sell China 1.8 million tons of food and buy from China 5.5 million tons of steel, giving a **terms of trade** of approximately 3 tons of steel per ton of food. (The terms of trade are the amount of imports a country receives per unit of exports.) The United States and China would then end up consuming the amounts in the bottom rows of Table 1A.2, all of which exceed what they could consume under **autarky** as shown in Table 1A.1. (Autarky means having no trade relations with other countries.)

The gains shown by comparing Table 1A.2 with Table 1A.1 are due to specializing production according to the countries' comparative advantages. The benefit of specializing production is only one of the gains from trade.

Further gains from international trade

Given our assumption that China is relatively more efficient at producing steel than food, and the United States is relatively more efficient at producing food than steel, under autarky we can expect food to be cheap relative to steel in the United States and steel to be cheap relative to food in China. This suggests that by exporting food to China, where

15 Of course, it is individuals, not nations, who make production decisions. However, referring to countries as if they make production decisions is a convenient anthropomorphism.

Table 1A.2 *Input/output under free trade*

Output	*US*	*China*
	Millions of people employed	
Food	125	12
Steel	25	68
	Total output, millions of tons	
Food	5	0.6
Steel	2.5	17
	Consumption amounts under trading division	
Food	3.2	2.4
Steel	8	11.5

food is relatively expensive in the absence of trade, the United States can receive a relatively large amount of steel in return. Similarly, by exporting steel to the United States, where steel is relatively expensive in the absence of trade, China can receive a relatively large amount of food. Therefore, via exchange of products through trade, both countries can be better off. This gain is a **pure exchange gain** and would be enjoyed even without any specialization of production. That is, there are two components to the gains from trade: the gain from adjusting the pattern of production (the gain from specialization) and the gain from adjusting the pattern of consumption (the pure exchange gain).[16]

The number of people required to produce the food and steel in our example is assumed to be the same, whatever the output of these products. That is, we have implicitly assumed **constant returns to scale**. However, if there are **increasing returns to scale** it will take fewer people to produce a given quantity of the product for which the country has a comparative advantage as more of that product is produced. In this case of economies of scale there are yet further gains from international trade. Returns to scale can come in many forms, including pure technological gains, benefits of learning by doing, and so on. In addition, if there is monopoly power within a country that is removed by trade, consumers enjoy an additional benefit in terms of lower prices due to increased competition.[17] Yet a further gain from trade comes in the form of an increase in product variety. In addition, international trade can make a broader range of inputs and technology available and thereby increase economic growth.[18] Therefore, the gain from exploiting comparative advantages is only part of the total gain from free trade.[19]

16 The pure exchange gain that comes from adjusting consumption cannot be shown in terms of our numerical example because demonstration of this gain requires measurement of relative satisfaction from the two products. This in turn requires the use of utility theory. Formal separation of the specialization gain from the pure exchange gain is generally presented in courses in the theory of international trade.

17 For evidence on this effect of trade, see James Levinsohn, "Testing the Imports-as-Market-Discipline Hypothesis," NBER Working Paper No. 3657, 1991.

18 See Gene M. Grossman and Elhanan Helpman, "Product Development and International Trade," *Journal of Political Economy*, December 1989, pp. 1261–1283, and "Growth and Welfare in a Small Open Economy," National Bureau of Economic Research [hereafter NBER] Working Paper No. 2970, May 1989. For an alternative view see Meir G. Kohn and Nancy P. Marion, "The Implications of Knowledge-Based Growth for the Optimality of Open Capital Markets," *Canadian Journal of Economics*, November 1992, pp. 865–883.

19 An account of the numerous sources of gains from trade can be found in Cletus C. Coughlin, K. Alec Chrystal and Geoffrey E. Wood, "Protectionist Trade Policies: A Survey of Theory, Evidence and Rationale," *Review*, Federal Reserve Bank of St. Louis, January/February 1988, pp. 12–26.

Some costs of international trade

While most economists believe that international trade is beneficial, there are possible costs to be weighed against the gains. One possible cost of free international trade occurs when a country finds its own firms put out of business and thereby exposes itself to exploitation by a foreign monopoly. This is the flip side to the gain from competition described above, and is likely to occur only in oligopolistic markets with very few producers.[20] For example, it has been argued that it can be advantageous for governments to subsidize aircraft production in Europe so as to reduce prices faced on imported aircraft from the United States.[21] Another possible drawback of trade is the reduction in economic diversity a country might face. This is the flip side of the gain from specialization. There is also a possibility, as discussed in Exhibit 1A.1, that trade has widened the gap between the rich and the poor. Finally, some people have decried international trade because of the homogenization of culture and possible political domination it has brought to the planet, while others have questioned trade because of possible impacts on the environment.[22] It is clear that, as in most of economics, there is no such thing as a free lunch.

EXHIBIT 1A.1 WHO IS BENEFITING FROM GLOBALIZATION?

Has globalization spread wealth and income more evenly between citizens of different nations, or has it widened the gap, rewarding those who were already well-off and leaving others in greater poverty? Not surprisingly, this question does not have a simple, clear answer, but some things can be claimed, at least according to a research paper, *Globalization and Poverty*, written by Ann Harrison and published by the National Bureau of Economic Research.*

Harrison starts out by recognizing that the connection between globalization and poverty cannot be viewed directly, but that the apparent association is that as developing nations have become more integrated in the world economy over the last couple of decades, poverty rates have declined.

Her paper presents the findings of fifteen economists who far from agree on key questions concerning how globalization has been associated with the inequality of income distribution. Many indicate increased inequality, especially in countries with large numbers of unskilled workers. Others note that in countries in which workers' movements from contracting to expanding sectors are more fluid – Colombia and India are cited as examples of countries enjoying relatively high labor mobility – the poor generally do well: workers are able to find the opportunities presented by the new economic landscape and escape the circumstances of declining areas of the economy. The ability to borrow for new businesses and to obtain technical skills – Zambia is quoted as an example – also appears to assist the poor, and social safety nets and food aid – Mexico and Ethiopia are mentioned in the studies covered by Harrison – also seem to help the poor in the globalizing process.

Globalization can be a two-edged sword, with integration of trade and inbound investment raising average standards of living at the cost of greater variability in that average standard. Indeed, specialization in a country's comparative advantage – producing what it can do relatively well – would be expected to do this by narrowing the range of economic activities, thereby exposing a country to the vicissitudes of its "terms of trade." (Terms of trade refers to the price of exports relative to the price of imports.) As in the case of an

20 See Elhanan Helpman and Paul R. Krugman, *Trade Policy and Market Structure*, MIT Press, Cambridge, MA, 1989.

21 See James A. Brander and Barbara Spencer, "Export Subsidies and International Market Share Rivalry," *Journal of International Economics*, February 1985, pp. 83–100.

22 On the effects on culture and political domination, see J. J. Servain-Schreiber, *The American Challenge*, Hamish Hamilton, London, 1968. On trade and the environment, see Alison Butler, "Environmental Protection and Free Trade: Are They Mutually Exclusive?," *Review*, Federal Reserve Bank of St. Louis, May/June 1992, pp. 3–16.

investment portfolio, fewer items in the portfolio, for given variances and covariances, mean greater volatility. Just as an investor faces a trade-off between risk and return, a country may enjoy faster growth at the risk of more volatile growth by specializing in its comparative advantages.† Integration into the world economy that goes with globalization also exposes countries to "contagion," with spillovers of such events as currency crises being the price of removal of segmenting economic barriers.

Harrison's paper vividly paints a picture of the complexity of the effects of globalization on poverty and income inequality. For one thing, effects depend on the size of enterprises. For example, small and medium-sized Mexican corn farmers appear to have lost from the market being opened to international trade, while large-scale corn farmers have gained. Effects also depend on other circumstances, such as investment in infrastructure, worker education and mobility, and the availability of capital markets. However, even when the right circumstances are present, there is almost inevitably a painful transition period as adjustments are made to structural changes brought by globalization.

* Ann Harrison, *Globalization and Poverty*, NBER Working Paper No. 12347, Cambridge, MA, 2007, summarized in *The NBER Digest*, March 2007.

† Portfolio arguments have been applied to the constitutions of countries – how they are composed of different parts – and to the constitutions of economic unions. See Michael Goldberg and Maurice Levi, "The Political Economy of Diversity: Portfolio Analysis of Alternative Configurations of the European Union," *European Journal of Political Economy*, Vol. 16, 2000, pp. 411–427; and Michael Goldberg and Maurice Levi, "Growing Together or Apart: The Risks and Returns of Alternative Constitutions of Canada," *Canadian Public Policy*, December 1994, pp. 341–352.

APPENDIX B

The gains from the international flow of capital

In Appendix A we showed that everybody can simultaneously benefit from international trade in goods and services. Here we show that everybody can also simultaneously gain from the international flow of financial capital. Between them, the international flow of goods and services and the international flow of capital constitute the sum total of reasons for the supply of and demand for foreign exchange. Indeed, as we shall show in Chapter 7, the two major subdivisions of the balance-of-payments account – the current account and the capital account – report respectively the demand for and supply of a country's currency due to trade in goods and services, and the supply of and demand for the currency due to the flow of capital. Therefore, this and the previous appendix show that the very bases of the study of international finance – transactions due to the flow of goods and services and the flow of capital – are both important contributors to our well-being. It is not, as is often thought, just the free international flow of goods and services from which we benefit.

We have already noted in the text of this chapter that the international flow of capital means that a project with a very high yield in one country is not forgone for want of funds while a low-yield project in a country of abundant capital goes ahead. Capital flowing between the countries benefits everybody because the investors in the country with the low-yield projects can enjoy some of the high returns offered in the other country, while the country with the high-yield projects is able to fund projects that would otherwise be forgone. This is potentially a very important gain from the international flow of capital, and is illustrated graphically in Figure 1B.1.

The heights of the curves I_A and I_B in Figure 1B.1 give the rates of return on investment in countries A and B at different rates of investment; that is, at different amounts of investment during a given time interval. The curves slope downward because countries run out of good investment projects as their rates of investment increase: the more

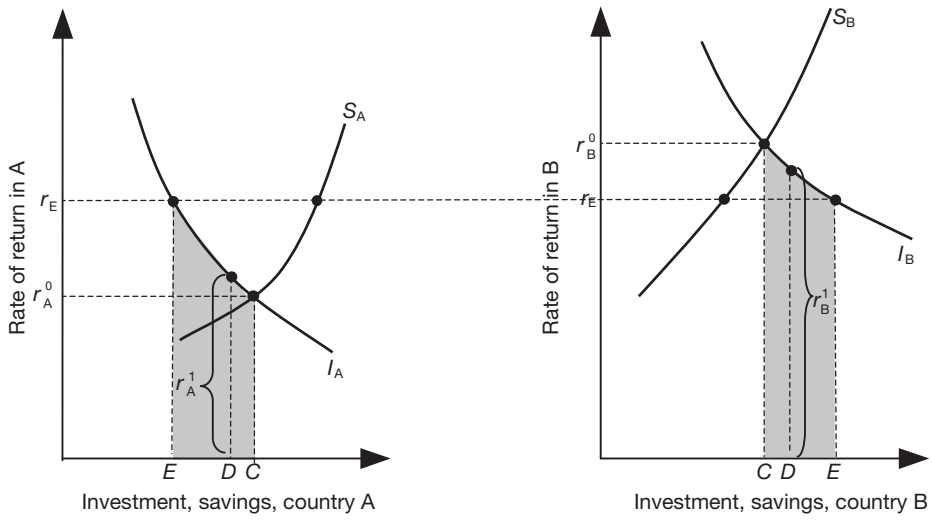

Figure 1B.1 *The gain from the better allocation of capital*

Notes
The heights of the curves I_A and I_B give the rates of return on an extra dollar's worth of investment in countries A and B. The curves S_A and S_B give savings at different returns on savings in the two countries. With no flow of capital between the countries, returns will be r_A^0 and r_B^0. Each dollar moving from A to B will result in a forgone return in A given by the height of I_A, and a return in B given by the height of I_B. For example, after CD dollars have left A for B, the added global return from *another* dollar is $r_B^1 - r_A^1$. The maximum gain from reallocating capital occurs at r_E and is given by the difference between the two shaded areas; the shaded area in B is the *total* return on investment between C and E, while the shaded area in A is the forgone *total* return on investment between C and E.

projects are pursued the lower the expected return from an incremental project.[23] The curves labeled S_A and S_B give the amounts saved at different rates of return earned on people's savings. If there is no flow of capital allowed between the countries, the equilibrium expected returns in A and B are r_A^0 and r_B^0.

The first dollar to flow from A to B means a forgone investment return in A of r_A^0 in return for a return in B from that dollar of r_B^0. This is a net gain of $(r_B^0 - r_A^0)$. After $\$CD$ of capital has moved from A to B, an additional dollar of capital flow produces a net gain of $(r_B^1 - r_A^1)$. It should be clear from the figure that there is a global gain in return from investment until enough capital has moved to equalize returns in the two countries. Indeed, if the interest rate in countries A and B is r_E, where by assumption the excess of investment over savings in B matches the excess of savings over investment in A, then the gain from a better capital flow is at a maximum. This maximum gain can be shown in the figure by recognizing that the *total* return from investment can be measured from the area under the investment curve for that amount of investment. For example, the return on the investment between C and E on the right-hand-side of Figure 1B.1 is the shaded area: each *incremental* dollar of investment has a return given by the height of the investment curve, so adding all incremental gains between C and E gives the area beneath the curve. Against the return in B from imported capital is the forgone return in A from which capital is being exported. This lost return is given by the area beneath I_A between C and E on the left-hand-side of Figure 1B.1. The difference between the two areas is at a maximum at the equilibrium interest rate r_E. This is the rate that would occur in an integrated global capital market because it is the rate at which $S_A + S_B = I_A + I_B$. (Note that at the equilibrium interest rate r_E the excess of savings over investment in country A is equal to the excess of investment over savings in country B.)

23 The height of I_A or I_B is referred to as the **marginal efficiency of investment**.

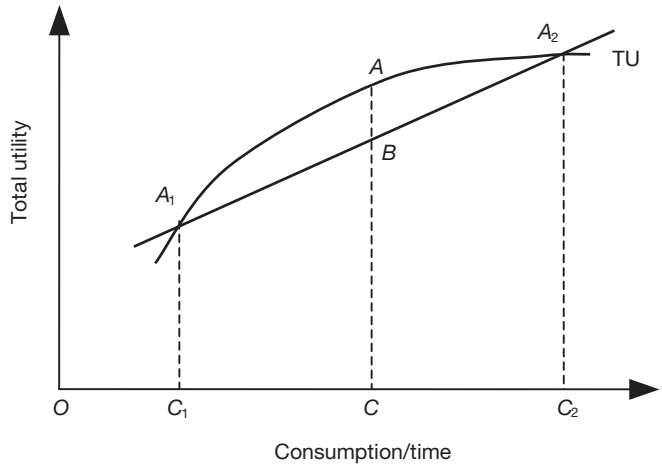

Figure 1B.2 *Utility from different consumption patterns*

Notes
If a country faces variable consumption, being with equal frequency C_1 and C_2, the average total utility level that it enjoys is distance BC. This is the average of distances A_1C_1 and A_2C_2. If the country borrows from abroad during bad times and lends abroad during good times, and thereby enjoys consumption at C every period, it enjoys a utility level given by a distance AC. The gain from smoothing consumption via borrowing from abroad and lending abroad is distance AB. This is a gain from the international flow of capital.

There is a further benefit of the international flow of capital that comes from the smoothing of consumption that is permitted by lending and borrowing. This gain comes from the fact that if a nation were unable to borrow from abroad it would have limited scope to maintain consumption during temporary declines in national income.[24] Similarly, if the nation were unable to invest abroad, it would have limited scope for dampening temporary jumps in consumption during surges in national income.

It is frequently assumed that people are subject to diminishing marginal utility of income and consumption. Indeed, this is a basic rationale for the postulate of risk aversion which is essential to much of the theory of finance. Diminishing marginal utility of consumption means that a more even path of consumption over time is preferred to a more erratic path with the same average level of consumption. The reason for this preference for a smooth path of consumption over time is illustrated in Figure 1B.2.

The curve labeled TU shows the total utility derived from different rates of consumption. Because the curve slopes upward throughout its range, it shows that higher levels of consumption are preferred to lower levels; that is, total utility from consumption increases as consumption increases. However, the rate at which total utility increases with consumption diminishes as consumption expands. This is revealed by the lower slope of curve TU as consumption increases; that is, as we move to the right along TU. The slope of TU gives the increase in total utility per unit of added consumption and is called the **marginal utility**.[25]

24 National income, which is roughly equivalent to the gross national product and usually denoted by Y, can be classified into consumption C, investment I, government spending G, and exports minus imports $(Ex - Im)$. This classification is met frequently in macroeconomics as the national income identity, $Y \equiv C + I + G + (Ex - Im)$. We see that for a decline in Y not to involve a decline in consumption it would be necessary to suffer a decline in investment, government spending, or exports minus imports. All these alternatives involve costs.

25 Most introductory finance textbooks deal with the notion of diminishing marginal utility of consumption and its role in risk aversion. See, for example, Richard Brealey, Stewart Myers and Franklin Allen, *Principles of Corporate Finance*, 8th edn., McGraw-Hill, New York, 2006.

If a nation is forced to vary consumption from year to year because it cannot borrow and invest internationally and prefers not to vary other components of its national product, it may find itself consuming C_1 in one year when national income experiences a decline, and C_2 in the following year when national income experiences a favorable fluctuation. The total utility from consumption of C_1 is given by the distance A_1C_1, while the total utility from C_2 is given by A_2C_2. The average of A_1C_1 and A_2C_2, which is the average utility enjoyed in the two years, can be found by drawing a straight line between A_1 and A_2 and finding the height of this line at its center. This follows because the height of the line halfway between A_1 and A_2 is the average of A_1C_1 and A_2C_2. We find that the average utility from the two years of variable consumption is BC.

If the nation can borrow it might borrow the amount of C_1C during the economic downturn allowing it to consume OC. The nation might then lend amount CC_2 during the upturn and therefore also consume amount OC during this time.[26] With consumption of OC in both periods, and with total utility given by the distance AC in both periods, the average total utility is simply AC. It is clear by inspecting Figure 1B.2 that the utility when consumption is smoothed by international borrowing and lending is higher than when borrowing and lending do not occur. Intuitively, this outcome is because the added or marginal utility of income during the period of higher consumption is smaller than the marginal utility lost during the period of lower consumption.

The empirical relevance of the preceding argument has been examined by Michael Brennan and Bruno Solnick.[27] They start by calculating what consumption would have been without international capital flows. This is determined by subtracting private capital flows from actual consumption during years when there was a net capital inflow to the country, and adding private capital flows to actual consumption during years of net capital outflow. This tells us what would have had to happen to consumption if borrowing and lending had not occurred.[28] All consumption data are put in per capita terms and adjusted for inflation.

Brennan and Solnik compute the standard deviations of the growth rates of consumption adjusted for capital flows and compare these with the standard deviations of the growth rates of actual consumption. This comparison is made for the **Organization for Economic Cooperation and Development (OECD)** countries. They find that on average the standard deviations of actual consumption growth rates – which include international capital flows – are less than half the standard deviations of adjusted consumption growth rates – which exclude international capital flows. The reduction in standard deviation due to international capital flows is apparent in every country they examined, and for all measures of capital flows they considered.[29]

Investment in new capital could, like consumption, be smoothed via international capital flows. The empirical evidence suggests, however, that relatively little investment smoothing occurs. This has been concluded from studies of the connection between saving and investment *within countries*. In completely integrated capital markets, a dollar increase in domestic saving would leave domestic investment unchanged and instead result in a dollar of exported

26 Borrowing and lending involves paying and receiving interest. However, if the amount borrowed equals the amount subsequently lent, and if the periods are close together so that time value of money is unimportant, payments and receipts of interest cancel and can be ignored.

27 See Michael J. Brennan and Bruno Solnik, "International Risk Sharing and Capital Mobility," *Journal of International Money and Finance*, September 1989, pp. 359–373.

28 This assumes all borrowing and lending affects consumption and not the other components of national product. Of course, borrowing and lending do in reality affect government spending and investment. However, a smoother pattern of government spending and investment should contribute to smoother consumption. Furthermore, consumption is often considered as the end purpose of economic activity. This supports the case for concentrating on consumption.

29 The implications of consumption smoothing for welfare are overstated in Brennan and Solnik (n. 27). See Maurice Obstfeld, "International Risk Sharing and Capital Mobility: Another Look," *Journal of International Money and Finance*, February 1992, pp. 115–121 and Michael J. Brennan and Bruno Solnik, "International Risk Sharing and Capital Mobility: Reply," *Journal of International Money and Finance*, February 1992, pp. 122–123.

capital. What has been shown, however, is that each dollar increase in domestic saving is, on average, associated with a 79 cent increase in net domestic investment.[30]

A benefit from international capital flows that is closely related to the gain from consumption smoothing is the gain from increased diversification of investment portfolios. This gain exists because the economic ups and downs in different countries are not perfectly synchronized. This allows internationally diversified investors to achieve a higher expected return for a given degree of risk, or a lower risk for a given expected return. We do not discuss this here as it is discussed extensively in Chapter 18. However, it should be clear that diversification gains depend on different countries having different economic conditions and experiences, as do the other gains from the free movement of capital which we have described in this appendix.

30 See Martin Feldstein and Phillipe Bachetta, "National Saving and International Investment," NBER Working Paper No. 3164, 1990.

Section I

The markets for foreign exchange

The foreign exchange market, which has several connected but nevertheless different parts, is the most active market on Earth, with daily turnover exceeding that of major stock markets. Along with the size of the market go massive profits and losses of unwary companies, opportunistic speculators and central banks, as well as substantial income and employment in commercial and central banks, currency brokerages, and specialized futures and options exchanges.

Section I, which consists of three chapters, introduces the reader to the different components of the foreign exchange, or **forex**, market. Chapter 2 begins by considering the exchange of banknotes, such as the exchange of US Federal Reserve notes – the paper money, or cash, Americans carry in their wallets – for euros or British pounds. It also explains how money in the form of bank deposits is exchanged in the **spot foreign exchange market**. An understanding of what actually happens when a person calls a bank to buy a foreign currency requires that we know how customers are debited and credited, and how the banks trade and settle transactions between themselves. This is all explained in Chapter 2. The chapter ends by showing why knowledge of exchange rates of each currency against the US dollar allows us to calculate all possible exchange rates. For example, it is shown why we can calculate the exchange rate between the euro and the British pound from the euro–US dollar exchange rate and the pound–US dollar exchange rate. It is also shown why this ability to compute so-called **cross exchange rates** is nevertheless limited in reality by the presence of foreign exchange transaction costs.

Chapter 3 describes another component of the foreign-exchange market that plays an important role throughout the remainder of the book. This is the **forward exchange market**. Forward exchange involves a contractual arrangement to exchange currencies at an agreed exchange rate on a stated date in the future. The forward market plays an important role in avoiding foreign exchange risk (hedging) and in choosing to take risk (speculating). Chapter 3 provides the necessary background so that we can show in later chapters how forward exchange can be used for hedging and speculating.

After explaining the forward market we turn our attention to currency derivatives that, as their name suggests, *derive* their values from underlying values of currencies. The derivatives discussed in Chapter 4 are **currency futures, currency options**, and **swaps**. Currency futures are similar to forward exchange contracts in that they help fix the net cost of or receipts from foreign exchange involved in future transactions. However, currency futures trade on formal exchanges such as the Chicago International Money Market of the Chicago Mercantile Exchange, have only a limited number of value dates, come in particular contract sizes, and can be sold before they become due. There are also a few other institutional differences that we describe. These differences make forward contracts and currency futures of slightly different value as vehicles for hedging and speculation.[1]

Chapter 4 also describes currency options and swaps. Unlike forward contracts and currency futures, options allow buyers of the contracts discretion over whether to exercise (complete) an exchange of currencies at a specified exchange rate. Different types of currency options

1 Most importantly, forwards are used to settle transactions, whereas futures and options are not. It is primarily for this reason that we treat forward exchange in a separate chapter.

are described, along with the factors that affect market prices, or **premiums**, on options. Currency swaps involve twinned transactions – specifically arrangements to buy and to sell a currency, where the buying and selling are separated in time. For example, somebody buying a British Treasury bill might buy the British pound spot and at the same time sell it forward for the date of maturity of the Treasury bill.

The specifics of using futures, options, and swaps, and their roles in hedging and speculating are only briefly covered in Chapter 4; we save the details for later chapters in which investment, borrowing, hedging, and speculation are covered in greater depth. In Part One the purpose of the discussion is primarily to introduce the reader to the institutional details of these fascinating and vital markets for foreign exchange.

Chapter 2

An introduction to exchange rates

> The market in international capital . . . is run by outlandishly well-paid specialists, back-room technicians and rows of computer screens. It deals in meaninglessly large sums of money. It seems to have little connection with the "real" world of factories and fast-food restaurants. Yet at times . . . it seems to hold the fate of economies in its grasp. The capital market is a mystery and it is a threat.
>
> *The Economist*, September 19, 1992

To the ordinary person, international finance is synonymous with exchange rates; and, indeed, a large part of the study of international finance involves the study of exchange rates. What is not widely known is the variety of exchange rates that exist at the same moment between the same two currencies. There are exchange rates for **banknotes**, which are, for example, the Federal Reserve notes with pictures of former US presidents, and the equivalent notes issued by the European Central Bank (ECB). Banknotes are simply what most people would call cash. There are also exchange rates between electronic or paper checks stating dollar amounts and those stating amounts in euros or other currency units. Furthermore, the rates on these checks depend on whether they are issued by banks – **bank drafts** – or by corporations – **commercial drafts** – and on the amounts of money they involve, and on the dates on the checks.[1] Exchange rates also differ according to whether they are for the purchase or sale of a foreign currency. That is, there is a difference, for example, between the number of US dollars required in order to *purchase* a British pound, and the number of US dollars received when *selling* a pound.

We will begin by looking at exchange rates between banknotes, or cash. While the market for banknotes is only a small proportion of the overall foreign exchange market, it is a good place to begin because banknotes are the form of money with which people are most familiar.

THE FOREIGN BANKNOTE MARKET

The earliest experience that many of us have of dealing with foreign currency is on our first overseas vacation. When not traveling abroad, most of us have very little to do with foreign exchange which is not used in the course of ordinary commerce, especially in the United States. The foreign exchange with which we deal when on vacation involves banknotes, or possibly foreign-currency-denominated travelers' checks. Table 2.1 gives an illustration of the exchange rates on banknotes facing a traveler in August 2007. Let us take a look at how these retail banknote rates are quoted.

The first column of Table 2.1 gives exchange rates in terms of the number of units of each foreign currency that must be *paid to the bank* to buy a US dollar. The column is headed "Bank buys foreign currency (sells US $)" because when a bank buys foreign currency from a customer, it pays, or sells, the customer US dollars. Table 2.1 shows, for example, that it takes 3.26 Argentine pesos or 1.25 Australian

1 A commercial draft is simply a check issued by a company.

Table 2.1 *Exchange rates on foreign banknotes (Traveler's dollar – August 15, 2007)*

	Foreign currency per US dollar	
	Bank buys foreign currency (sells US $)	*Bank sells foreign currency (buys US $)*
Argentina (Peso)	3.26	3.04
Australia (Dollar)	1.25	1.17
Bahamas (Dollar)	1.03	0.97
Brazil (Real)	2.08	1.92
Britain (Pound)	0.52	0.48
Canada (Dollar)	1.11	1.05
Chile (Peso)	540.00	505.00
China (Renminbi)	7.85	7.35
Colombia (Peso)	2100.00	1950.00
Denmark (Krone)	5.75	5.35
Europe (Euro)	0.76	0.71
Fiji Islands (Dollar)	1.68	1.56
Ghana (Cedi)	0.97	0.89
Honduras (Lempira)	19.75	18.00
Hong Kong (Dollar)	8.05	7.55
Iceland (Krona)	69.55	65.20
India (Rupee)	42.25	39.50
Indonesia (Rupiah)	9700.00	9100.00
Israel (Shekel)	4.35	4.10
Japan (Yen)	121.00	112.00
Malaysia (Ringgit)	3.62	3.33
Mexico (New Peso)	11.55	10.65
Morocco (Dirham)	8.65	7.95
New Zealand (Dollar)	1.45	1.35
Norway (Krone)	6.15	5.72
Pakistan (Rupee)	62.40	57.50
Panama (Balboa)	1.03	0.97
Peru (New Sol)	3.25	3.03
Philippines (Peso)	48.00	44.50
Russia (Rouble)	26.65	24.80
Singapore (Dollar)	1.58	1.48
South Africa (Rand)	7.65	7.15
South Korea (Won)	965.00	910.00
Sri Lanka (Rupee)	115.00	106.00
Sweden (Krona)	7.15	6.75
Switzerland (Franc)	1.25	1.17
Taiwan (Dollar)	34.25	31.75
Thailand (Baht)	33.75	31.75
Trinidad/Tobago (Dollar)	6.55	6.05
Tunisia (Dinar)	1.33	1.24
Turkey (New Lira)	1.39	1.30
Venezuela (Bolivar)	2220.00	2050.00

Source: Based on exchange quotations, August 15, 2007, particularly the foreign exchange website for the Pacific Exchange Rate Service of the Sauder School of Business

dollars to buy a US dollar from the bank. The second column gives the number of units of each foreign currency that a customer will *receive from the bank* for each US dollar. For example, the traveler will receive £0.48 or 1.05 Canadian dollars for each US dollar.

The rates of exchange posted for travelers in bank and currency exchange windows or international tourist centers are the most expensive or unfavorable that one finds. They are expensive in the sense that the buying and selling prices on individual currencies can differ by a large percentage – frequently more than 5 or 6 percent. The difference between buying and selling prices is called the **spread**. In Table 2.1 we see that, for example, the 0.08 (= 1.25 – 1.17) difference between the buying and selling exchange rates for the Australian dollar versus the US dollar is a spread of just over 6 percent. Differences between the effective buying and selling rates on paper currency can be particularly large on very small transactions when there is a fixed charge for conversion as well as a spread between buying and selling rates.

Our experience of changing currencies on vacation should not lead us to believe that large-scale international finance faces similar costs. The banknote market used by travelers involves large spreads because generally only small amounts are traded, which nevertheless require as much paperwork as bigger commercial transactions. Another reason why the spreads are large is that each bank and currency exchange must hold many different currencies to be able to provide customers with the currencies they want, and these notes do not earn interest. This involves an opportunity cost of holding currency inventory, as well as risk from short-term changes in exchange rates. Furthermore, bank robbers specialize in banknotes; therefore, those who hold large amounts of them are forced to take costly security precautions – especially when moving banknotes from branch to branch or country to country. A further risk faced in the exchange of banknotes is the acceptance of counterfeit bills which frequently show up outside their own country where they are less likely to be identified as forgeries.

It is worth noting that because banks face a lower risk of theft of travelers' checks, and because the companies that issue them – American Express, Visa, Thomas Cook, MasterCard, and so on – will quickly credit the banks that accept their checks, many banks give a more favorable purchase exchange rate on checks than on banknotes. In addition, issuers of travelers' checks enjoy the use of the money paid for the checks before they are cashed. Furthermore, the banks selling the checks to customers do not face an inventory cost; payment to the check issuing company such as American Express by a check-selling bank is made only when the checks are being purchased by a customer. Travelers' checks also have the advantage of not having to be sent back to the county that uses the currency, unlike any surplus position of banknotes. They can be destroyed after the acceptor of the checks has been credited in their bank account. These benefits to the issuers and acceptors of travelers' checks keep down the buying–selling spread.

Credit card transactions share some of the advantages of travelers' checks. There is no need to move anything physically from country to country, no need to hold an inventory of non-interest-earning notes, and so on.

While the exchange of banknotes between ordinary private customers and banks takes place in a retail market, commercial banks and currency exchanges trade their surpluses of notes between themselves in a wholesale market. The wholesale market involves firms which specialize in buying and selling foreign banknotes with commercial banks and currency exchanges. These currency-trading firms are **banknote wholesalers**.

As an example of the workings of the wholesale market, during the summer a British bank might receive large net amounts of euros from tourists from Euro-zone countries traveling in Britain. The same British bank may also be selling large numbers of Swiss francs to British tourists leaving for vacations in Switzerland. The British bank will sell its surplus euros to a banknote wholesaler who might then transport the euro notes back to a bank in continental Europe or to a bank outside Europe in need of euro notes for their citizens intending to travel to Europe. The British bank will buy Swiss francs from a wholesaler who may well have transported them from

Switzerland, or brought them from banks which bought francs from vacationing Swiss. The spreads on the wholesale level are less than retail banknote spreads, generally well below 2 percent, because larger amounts are generally involved.

THE SPOT FOREIGN EXCHANGE MARKET

Far larger than the banknote market is the **spot foreign exchange market**. This is involved with the exchange of currencies held in different currency denominated bank accounts. The **spot exchange rate**, which is determined in the **spot market**, is the number of units of one currency per unit of another currency, where both currencies are in the form of bank deposits. The deposits are transferred from sellers' to buyers' accounts, with instructions to exchange currencies formally being paper checks, but nowadays taking the form of electronic messages. The instructions to debit this or that account in one currency and credit some other account in another currency are bank drafts. Delivery, or "value," from the electronic instructions is "immediate" – usually in one or two days. This distinguishes the spot market from the forward market (discussed in the next chapter) which involves the planned exchange of currencies for value at some date in the future – after a number of days, months, or even years.

Spot exchange rates are determined by the supplies of and demands for currencies being exchanged in the gigantic, global interbank foreign exchange market.[2] This market is legendary for the frenetic pace at which it operates, and for the vast amount of money which is moved at lightning speed in response to minuscule differences in price quotations.

Organization of the interbank spot market: SWIFT

The interbank foreign exchange market is the largest financial market on Earth. After correcting for double-counting to ensure a purchase by one bank and corresponding sale by a second bank is counted only once, average turnover is almost $4 trillion per day.[3] The largest part of trading, almost one-third of the global total, occurs in the United Kingdom. Indeed, the amount of foreign currency trading conducted in London is so large that a larger share of currency trade in US dollars and euros occurs in the United Kingdom than in the United States or any of the Euro-zone countries. Table 2.2 shows that the United States has the second-largest foreign exchange market, followed by Switzerland, Japan, and Singapore.

The foreign exchange market is an informal arrangement of the larger commercial banks and a number of foreign exchange brokers. The banks and brokers are linked together by telephone, Telex, and a satellite communications network called the **Society for Worldwide International Financial Telecommunications, SWIFT**. This computer-based communications system, based in Brussels, Belgium, links banks and brokers in just about every financial center. The banks and brokers are in almost constant contact, with activity in one financial center or another 24 hours a day.[4] Because of the speed of communications, significant events have virtually instantaneous impacts everywhere in the world despite the huge distances separating market participants. This is what makes the foreign exchange market just as efficient as a conventional stock or commodity market housed under a single roof.

The efficiency of the spot foreign exchange market is revealed in the extremely narrow spreads between buying and selling prices. These spreads can be smaller than a tenth of a percent of the value of a currency

2 The supply and demand curves for currencies are derived and used to explain the economic factors behind exchange rates in Chapter 8.

3 See the most recent *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity*, Bank for International Settlements, Basle, Switzerland. After a period of phenomenal growth, the turnover on the market temporarily declined, partly because of the advent of the euro: there is no longer need to exchange currencies when doing business between Germany, France, Italy, Spain, and so on.

4 Indeed, in the principal centers like New York, London, Tokyo, and Toronto, large banks maintain 24-hour operations to keep up with developments elsewhere and continue trading during other centers' normal working hours.