All About...

the Foreign Exchange Market in the United States

By Sam Y. Cross

Federal Reserve Bank of New York

1998

DOCKET A L A R M Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

FOREWORD

Over the past forty years, the Federal Reserve Bank of New York has published monographs about the operation of the foreign exchange market in the United States. The first of these reports, *The New York Foreign Exchange Market*, by Alan Holmes, was published in 1959. The second, also entitled *The New York Foreign Exchange Market*, was written by Alan Holmes and Francis Schott and published in 1965. The third publication, *Foreign Exchange Markets in the United States*, was written by Roger Kubarych and published in 1978.

Each of these publications presents a lucid and informed picture of the foreign exchange market and how it operates, filled with rich insights and reflecting a profound understanding of the market and its complex mechanisms. Roger Kubarych's report, written twenty years ago, provided a valuable analysis of the foreign exchange market that is still read and widely appreciated by persons interested in gaining a deeper understanding of that market.

But the foreign exchange market is always changing, always adapting to a shifting world economy and financial environment. The metamorphosis of the 1980s and '90s in both finance and technology has changed the structure of the market and its operations in profound ways. It is useful to reexamine the foreign exchange market from today's perspective.

The focus of the present book is once again on the U.S. segment of the global foreign exchange market. Chapters 1-3 describe the structure of the market and how it has changed. Chapters 4-6 comment on the main participant groups and the instruments that are traded. Chapters 7-8 look at foreign exchange trading from a micro, rather than macro, point of view—how an individual bank or other dealing firm sees things. Chapters 9-11 comment on some of the broader issues facing the international monetary system and how governments, central banks, and market participants operate within that system. This is followed by an epilogue, emphasizing that there are many unanswered questions, and that we can expect many further changes in the period ahead, changes that we cannot now easily predict.

Markets go back a long time—in English law, the concept was recognized as early as the 11th century—and it is interesting to compare today's foreign exchange market with historical concepts. More than one hundred years ago, Alfred Marshall wrote that "a perfect market is a district, small or large, in which there are many buyers and many sellers, all so keenly on the alert and so well acquainted in one another's affairs that the price of a commodity is always practically the same for the whole of the district."

Find authenticated court documents without watermarks at docketalarm.com.

Today's over-the-counter global market in foreign exchange meets many of the standards that classical economists expected of a smoothly functioning and effective market. There are many buyers and many sellers. Entry by new participants is generally not too difficult. The over-the-counter market is certainly not confined to a single geographical area as the classical standards required. However, with the advance of technology, information is dispersed quickly and efficiently around the globe, with vast amounts of information on political and economic developments affecting exchange rates. As in commodity markets, identical products are being traded in financial centers all around the world. Essentially, the same marks, dollars, francs, and other currencies are being bought and sold, no matter where the purchase takes place. Traders in different centers are continuously in touch and buying and selling from each other. With trading centers open at the same time, there is no evidence of substantial price differences lasting more than momentarily.

Not all features of today's over-the-counter market fully conform to the classical ideals. There is not perfect "transparency," or full and immediate disclosure of all trading activity. Individual traders know about the orders and the flow of trading activity in their own firms, but that information may not be known to everyone else in the market. However, transparency has increased enormously in recent years. With the growth of electronic dealing systems and electronic brokering systems, the price discovery process has become less exclusive and pricing information more broadly disseminated—at least for certain foreign exchange products and currency pairs. Indeed, by most measures, the over-the-counter foreign exchange market is regarded by observers as not only extremely large and liquid, but also efficient and smoothly functioning.

Many persons, both within and outside the Federal Reserve, helped in the preparation of this book, through advice, criticism, and drafting. In the Federal Reserve, first and foremost, before his tragic death, Akbar Akhtar was a close collaborator on the project over an extended period, contributing to all aspects of the effort and helping to produce much of what is here. Dino Kos and his colleagues in the Markets Group were exceedingly helpful. Allan Malz contributed in many important ways. Robin Bensignor, John Kambhu, and Steven Malin also provided much valuable assistance, and Ed Steinberg's contribution as editor was invaluable. At the Federal Reserve Board, Ralph Smith offered very useful suggestions and comments.

Outside of the Federal Reserve, Michael Paulus of Bank of America contributed profoundly and in many ways to the entire project, both in technical matters and on questions of broader philosophy. Christine Kwon also assisted generously. Members of the trading room staff at Morgan Guaranty were also very helpful. At Fuji Bank, staff officials provided valuable assistance. Richard Levich provided very helpful comments. - CHAPTERS

FOREWORD]
ONE-Trading Foreign Exchange:	1. How the Global Environment Has Changed	3
A Changing Market in a Changing World ➤ p. 3	2. How Foreign Exchange Turnover Has Grown	4
TWO-Some Basic Concepts: Foreign Exchange, the Foreign Exchange Rate, Payment and Settlement Systems ➤ p. 9	1. Why We Need Foreign Exchange	(
	2. What "Foreign Exchange" Means	9
	3. Role of the Exchange Rate	
	Bilateral and Trade-Weighted Exchange Rates	1
	4. Payment and Settlement Systems	1
	Payments via Fedwire and CHIPS	1
THREE-Structure of the	1. It Is the World's Largest Market	1
Foreign Exchange Market ▶ p. 15	2. It Is a Twenty-Four Hour Market	1
	3. The Market Is Made Up of an International Network of Dealers	1
	4. The Market's Most Widely Traded Currency Is the Dollar	1
	5. It Is an "Over-the-Counter" Market With an "Exchange-Traded" Segment	2
FOUR-The Main Participants	1. Foreign Exchange Dealers	2
in the Market ➤ p. 23	2. Financial and Nonfinancial Customers	2
	3. Central Banks	2
	Classification of Exchange Rate Arrangements, September 1997	2
	4. Brokers	2
	In the Over-the-Counter Market	2
	Voice Brokers	2
	Automated Order-Matching or Electronic Broking Systems	2
	In the Exchange-Traded Market	3
FIVE-Main Instruments:	1. Spot	3
Over-the-Counter Market	There Is a Buying Price and a Selling Price	3
▶ p.31	How Spot Rates Are Quoted: Direct and Indirect Quotes,	
	European and American Terms	3
	There Is a Base Currency and a Terms Currency	3
	Bids and Offers Are for the Base Currency	3
	Quotes Are in Basis Points	3
	Cross Rate Trading	3
	Deriving Cross Rates From Dollar Exchange Rates	3
	2. Outright Forwards Relationship of Forward to Spot Covered Interest Pate Parity	3
	Relationship of Forward to Spot—Covered Interest Rate Parity Role of the Offshore Deposit Markets for Euro-Dollars and Other Currencies	3
	How Forward Rates Are Quoted by Traders	3 3
	Calculating Forward Premium/Discount Points	3
	Calculating Fol ward Fremuni/Discoulle Pollits	3

C H A P T E R S

FIVE-Main Instruments:	3. FX Swaps	40
Over-the-Counter Market	Why FX Swaps Are Used	40
(continued from last page)	Pricing FX Swaps	41
	Some Uses of FX Swaps	41
	Calculating FX Swap Points	43
	4. Currency Swaps	44
	Purposes of Currency Swaps	44
	5. Over-the-Counter Foreign Currency Options	45
	The Pricing of Currency Options	48
	Delta Hedging	51
	Put-Call Parity	52
	How Currency Options Are Traded	52
	Options Combinations and Strategies	53
	Foreign Exchange Options Galore	54
SIX-Main Instruments:	1 Exchange Traded Eutures	59
	1. Exchange-Traded Futures Development of Foreign Currency Futures	62
Exchange-Traded Market ▶ p. 59	Quotes for Foreign Currency Futures	63
	2. Exchange-Traded Currency Options	64
	3. Linkages	65
	Linkages Between Main Foreign Exchange Instruments in Both	0.
	OTC and Exchange-Traded Markets	65
	ore and Exchange fraced Markets	05
SEVEN-How Dealers Conduct	1. Trading Room Setup	67
Foreign Exchange Operations ▶ p. 67	2. The Different Kinds of Trading Functions of a Dealer Institution	68
	3. Trading Among Major Dealers—Dealing Directly and Through Brokers	69
	Mechanics of Direct Dealing	69
	Mechanics of Trading Through Brokers: Voice Brokers and Electronic	
	Brokering Systems	71
	4. Operations of a Foreign Exchange Department	73
	5. Back Office Payments and Settlements	75
EIGHT-Managing Risk in	1. Market Risk	77
Foreign Exchange Trading	Measuring and Managing Market Risk	78
▶ p. 77	Value at Risk	78
	2. Credit Risk	80
	Settlement Risk—A Form of Credit Risk	81
	Arrangements for Dealing with Settlement Risk	82
	Sovereign Risk—A Form of Credit Risk	83
	Group of Thirty Views on Credit Risk	83
	Group or finity freme on orean mon	0.0

DOCKET A L A R M



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.