An Introduction to Trading in the Financial Markets

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Trading, Markets, Instruments, and Processes

R. "Tee" Williams

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Preface for the Set

The four books in the set are an exercise in reportage. Throughout my career, I have been primarily a consultant blessed with a wide array of projects for many different kinds of entities in Africa, Asia, Europe, and North America. I have not been a practitioner but rather a close observer synthesizing the views of many practitioners. Although these books describe trading and the technology that supports trading, I have never written an order ticket or line of computer code in anger.

The purpose of these books is to describe *what* individuals and entities in the trading markets do. Bob Simon of *60 Minutes* once famously asked two founders of the dot-com consulting firm Razorfish to describe what they did when they got to work each day and took off their coats. That is the purpose of these books: to examine what participants in the trading markets do each day when they take off their coats. These books do not attempt to prescribe what should occur or proscribe what should not.

The nature of the source material for these books is broad observation. In teaching professional development courses over nearly two decades, I have found that both those new to the markets and even those who have been market participants for years become experts in their specific area of activity; however, they lack the context to understand how their tasks fit into the overall industry. The goal of this set of books is to provide that context.

Most consulting projects in which I have participated have required interviews with people working in all phases of the trading markets about what they do and their views on how the markets work. Those views and opinions helped frame my understanding of the structure of the markets and the roles of its participants. I draw on those views, but I cannot begin to document all the exact sources.

I have isolated fun stories I have heard along the way, which I cannot attribute to a specific source, into boxes within the text. These boxes also include asides that are related to the subjects being discussed but that do not specifically fit into the flow.

The structure of the books presents information in a hierarchical form that puts entities, instruments, functions, technology, and processes into a framework. Categorizing information into hierarchies helps us understand the subject matter better and gives us a framework in which to view and understand new information. The frameworks also help us understand how parts relate to the whole. However, my experience as a consultant convinces me that while well-chosen frameworks can be helpful and appealing to those first coming to understand new subject matter, they also carry the risk that their perspective may mask other important information about the subjects being categorized. So for those who read these books and want to believe that the trading markets fit neatly into the frameworks presented here: "Yes," I said. "Isn't it pretty to think so."[1]

1 Ernest Hemingway. *The Sun Also Rises*, 1926, New York: Charles Scribner's Sons (Scribner).

FEATURES OF THE BOOKS

Figure FM.1 shows the books in this set with tabs on the side for each of the major sections in the book. The graphic is presented at the end of each major part of the books with enlarged tabs for the section just covered, with arrows pointing to the

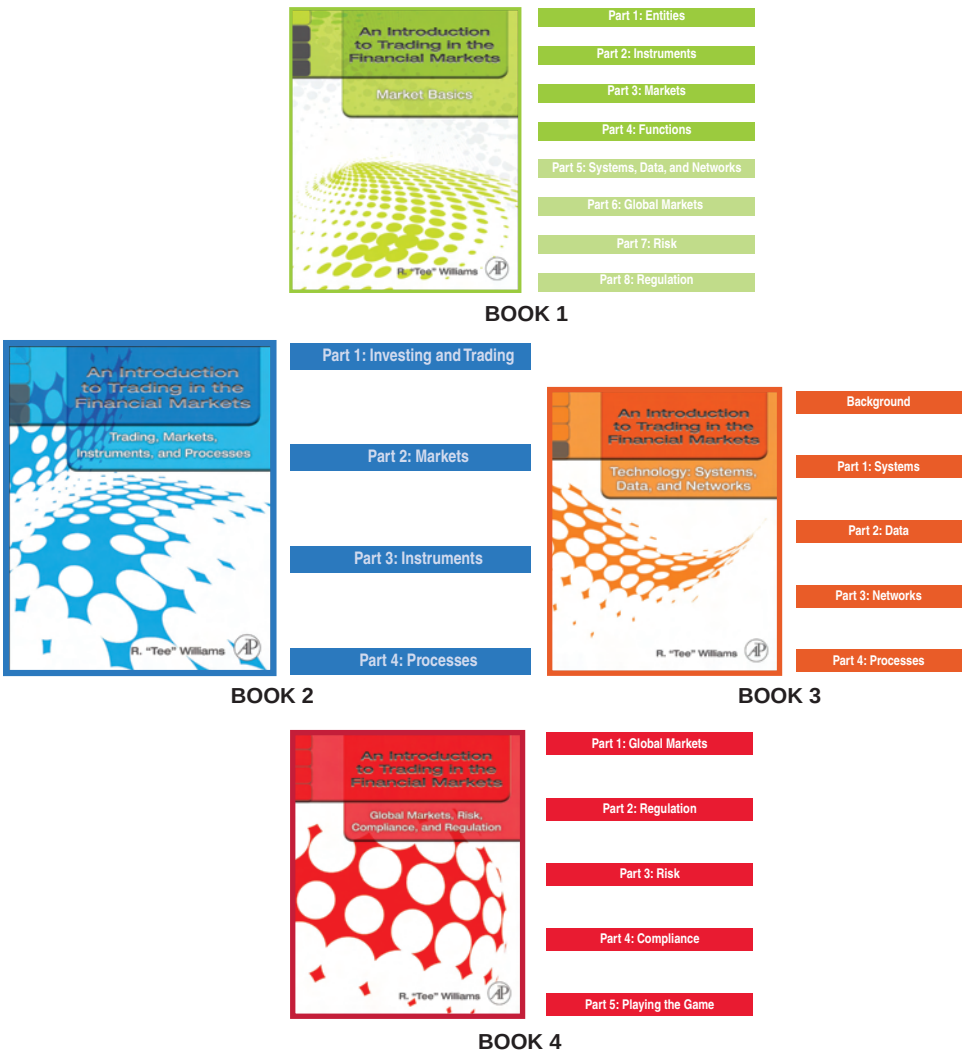

Figure FM.1 The ***books of this set*** are organized as a whole and concepts are distributed so that they build from book to book.

parts of other books and within the same book where other attributes of the same topic are addressed. I call this the "Moses Approach."[2]

In addition to words and graphics, the four books use color to present information, as shown in Figure FM.2. Throughout, the following color scheme represents the entities as well as functions, processes, systems, data, and networks associated with them.

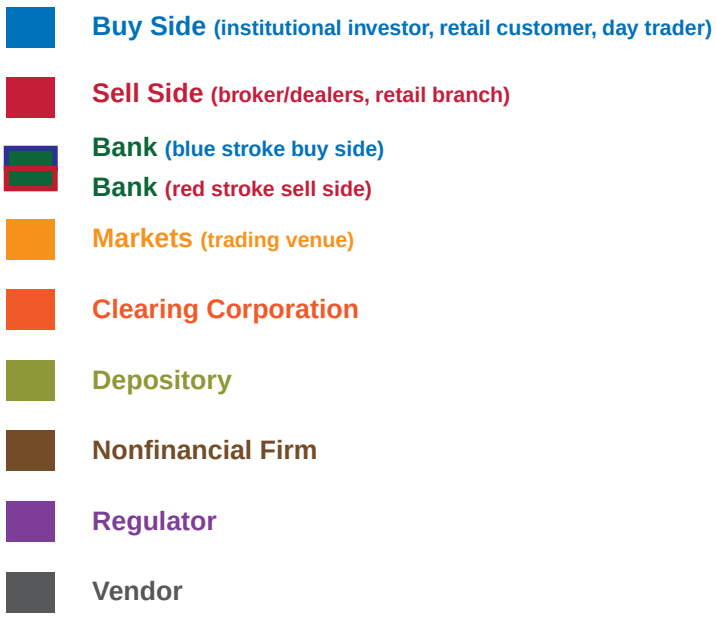

Figure FM.2 ***Color in these books*** identifies entities that are central to the trading markets, and also identifies the functions and processes that are associated with those entities.

A frustration of writing about the trading markets is the wealth of colorful and descriptive terms that permeate the markets. These terms are helpful in describing what happens in markets or where people work, but there is no accepted source that defines terms in everyday usage with precision. Good examples of this problem are the meaning and spellings of the terms "front office," "middle office" and "backoffice."[3] Similarly I use "indices" to mean a collection of individual instances of a single index. (For example closing *indices*—that is, values—of the Dow Jones Industrial Average on January 2, 3, and 4.) I use "indexes" to mean a collection of different copyrighted information products measuring market performance (e.g., the Dow Jones, FTSE, and DAX *indexes*).

I have elected to define the terms, as I understand them, within the books. The first instance of words appear in ***bold italics***, which relate to definitions in the Glossary at the end of each one. The books use more hyphenated adjectives than

2 You may remember from the Bible that God took Moses up on the mountain and, in addition to giving him the Ten Commandments, showed Moses the Promised Land. This seems to be a good approach to organizing information. If you expect people to wander in the wilderness of your prose, you at least owe them a glimpse of where they are going.
3 I separate "front" and "middle" from "office" and combine "backoffice." I believe that "backoffice" is a widely used term throughout the economy, whereas "front office" and more particularly "middle office" are nonce terms that may not migrate into common usage beyond the trading markets.

normal usage would require. I believe it is important to remove all doubt that the term "market-data systems" refers to systems for handling market data, not data systems used by a market.

The books in this set contain a large number of graphics. The goal of them is to provide more than decoration. For many people, graphics help them understand the concepts described in the text. Most of them illustrate process flows, relationships, or characteristics of market behavior. There is neither tabular data nor URLs from websites here. Both are likely to be too dated by the time the books are shipped from the publisher to you to provide any real value.

The graphics (and text) build from book to book. For example, in Part 1 of Book 1 the graphic in Figure FM.3 describing institutional investors appears. It shows

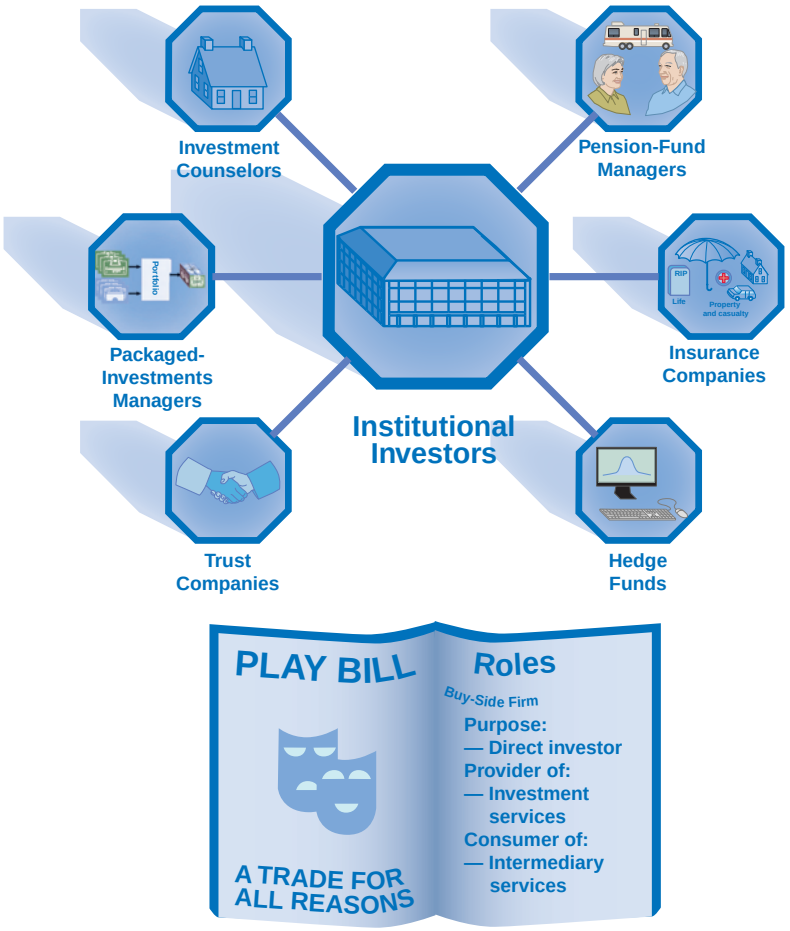

Figure FM.3 ***Institutional investors*** are introduced as important buy-side entities in Figure 1.1.3[4] of Book 1.

4 The figure numbers indicate that this is the third figure of the first category (buy side) of the first part (entities). All figure numbers follow this pattern.

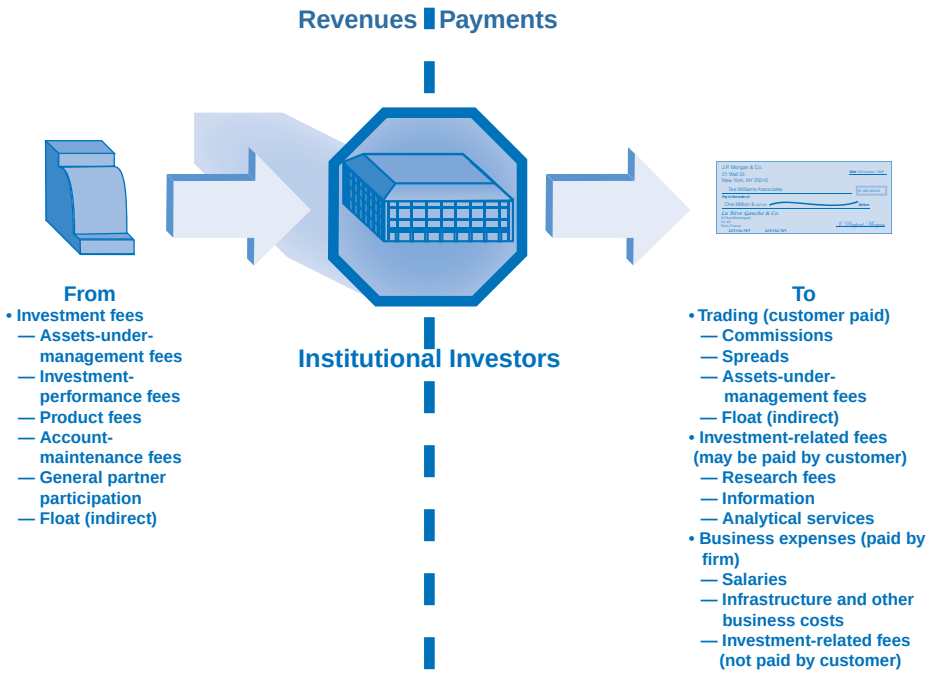

Figure FM.4 ***Institutional investor business models***—revenues and expenses—are illustrated in Book 1, Figure 1.1.3.7.

the customers, the suppliers, and the products and services for institutional investors. (Subsequent sections describe types of institutional investors based on how they are regulated or the service they perform.)

At the end of each entity subsection, the entity's core business model and what services it purchases from vendors and other providers are explained (see Figure FM.4).

Part 4 of Book 1 describes the functions performed by buy-side traders who work in institutional-investor firms (see Figure FM.5). The figure illustrates what tasks the buy-side trader performs (i.e., which other functions), who the buy-side trader serves, which external entities interact with the buy-side trader, and which other functions provide services to the buy-side trader.

Book 2, Part 4, describes the secondary market trading process. The second step in the trading process describes the initial role that the buy-side trader plays in trading.

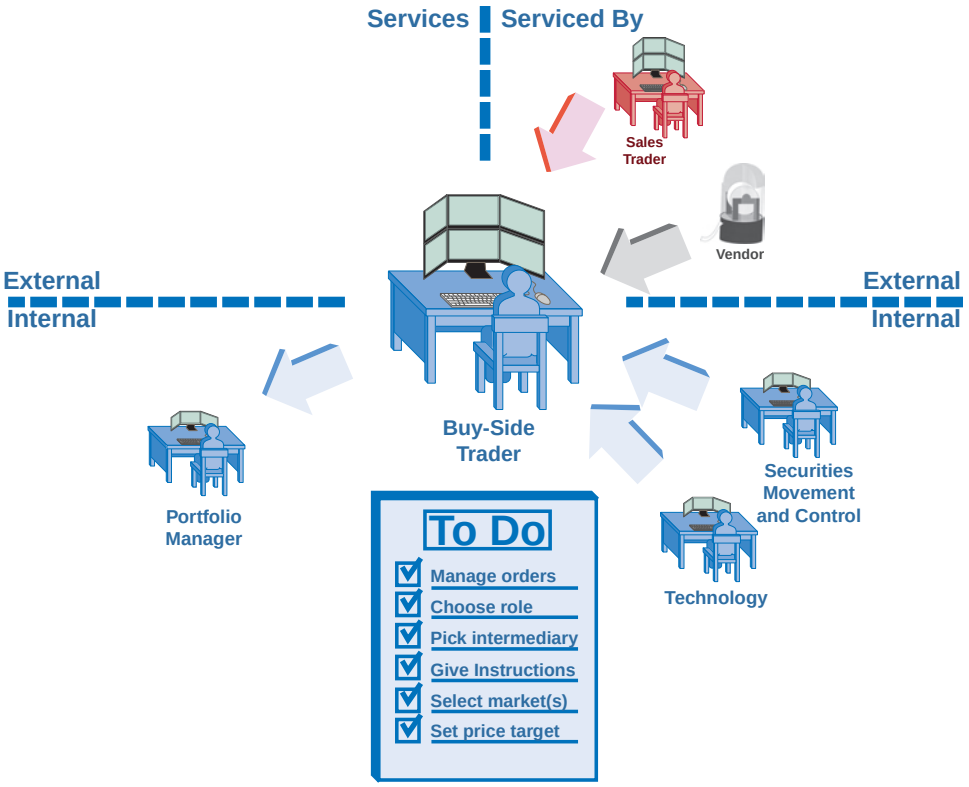

Figure FM.5 ***Buy-side traders*** manage trade execution within institutional investors and their functions are detailed in Figure 4.1.2.1 of Book 1.

Figure FM.6 presents the inputs to and outputs from the buy-side trading process as well as the primary focus of the buy-side trader and the decisions that the person must confront. Subsequent graphics in that section examine some of the decisions and alternatives in more detail.

Book 3 returns to the buy-side trader to understand the role of technology in the process. Part 4 of that book examines the systems, data, and networks that support buy-side trading.

Figure 4.3.2.2 in Book 3 (Figure FM.7, see page xii) shows the systems, data, and networks that support buy-side trading. The text identifies applications supplied by both internal and external sources that support order management. The buy-side trader generates information that is input directly to internal systems and indirectly to external systems. Finally, networks both within the firm and from markets and vendors provide linkages that facilitate the entire process. Subsidiary figures highlight the specific types of systems, data, and networks that are input to and output from buy-side trading.

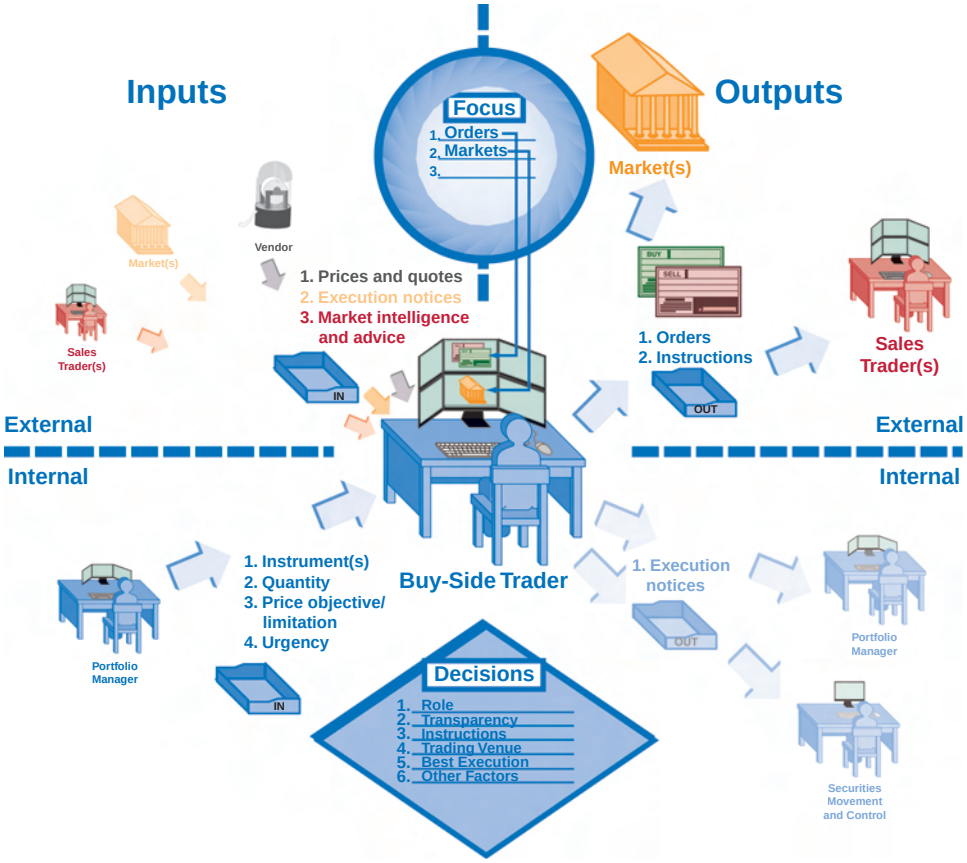

Figure FM.6 ***Buy-side trading*** is defined further as part of the trading process in Figure 4.2.2 of Book 2.

Finally, Book 4, Part 4, presents a hypothetical example that describes how a fictitious British investment management firm with a global presence manages an order across multiple markets with time, customer, and market pressures.

Here, David Anderson,[5] a London-based buy-side trader for Trafalgar Asset Management Ltd., is tasked with coordinating the sale of a very large order (500,000 shares) of In-the-Ether Networks (ticker symbol: ITEN) B.V., a Dutch network company with equities that are actively traded globally on the exchanges, ECNs, and MTFs in Amsterdam, Frankfurt, Hong Kong, London, New York, and Singapore.

5 All the names in the "Playing the Game" part are fictitious. However, I do know three different David Andersons, all of whom are Brits and work in some portion of the trading markets. These three gentlemen are the inspiration for the name. However, none of the David Andersons that I know are buy-side traders.

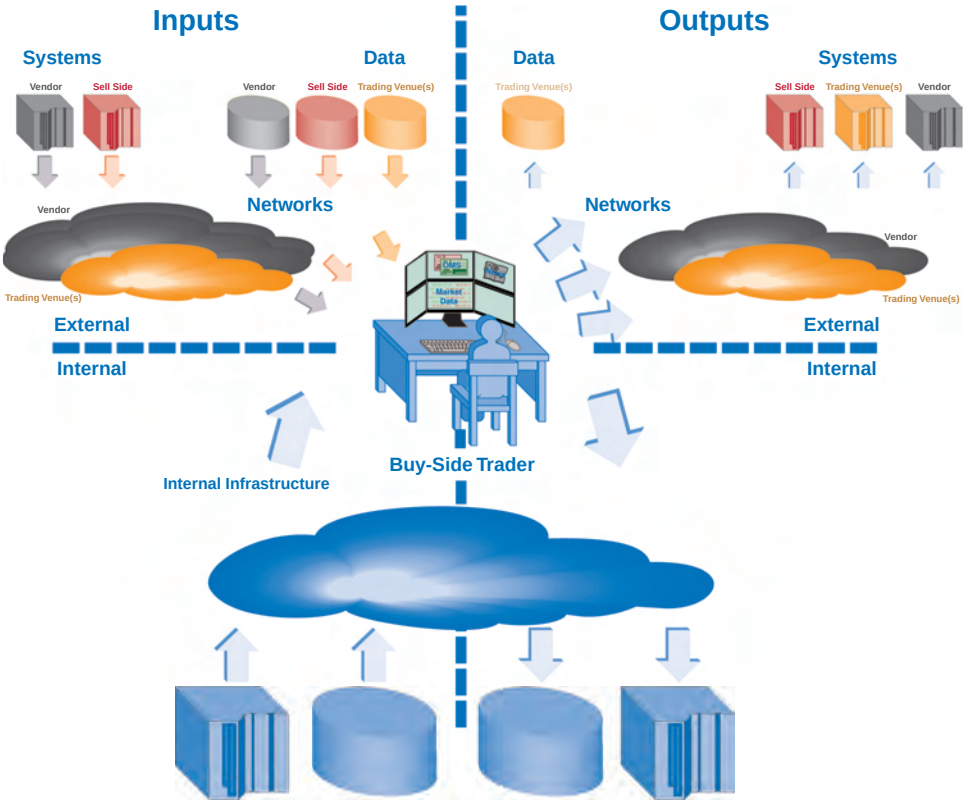

Figure FM.7 ***Buy-side trading*** requires systems, data, and networks and produces data as shown in Book 3, Figure 4.3.2.2.

The graphic in Figure FM.8 shows how the order is received along with instructions for its execution. As the process proceeds, the text describes how the order is then divided among global offices, electronic systems, and intermediaries to be executed through a continuing global process over two elapsed London days. The text also describes the settlement process following the trade. A large trade in multiple markets strains systems data and communications that were created when national markets were insular and did not interact. Subsequent graphics show how the process described in the narrative unfolds.

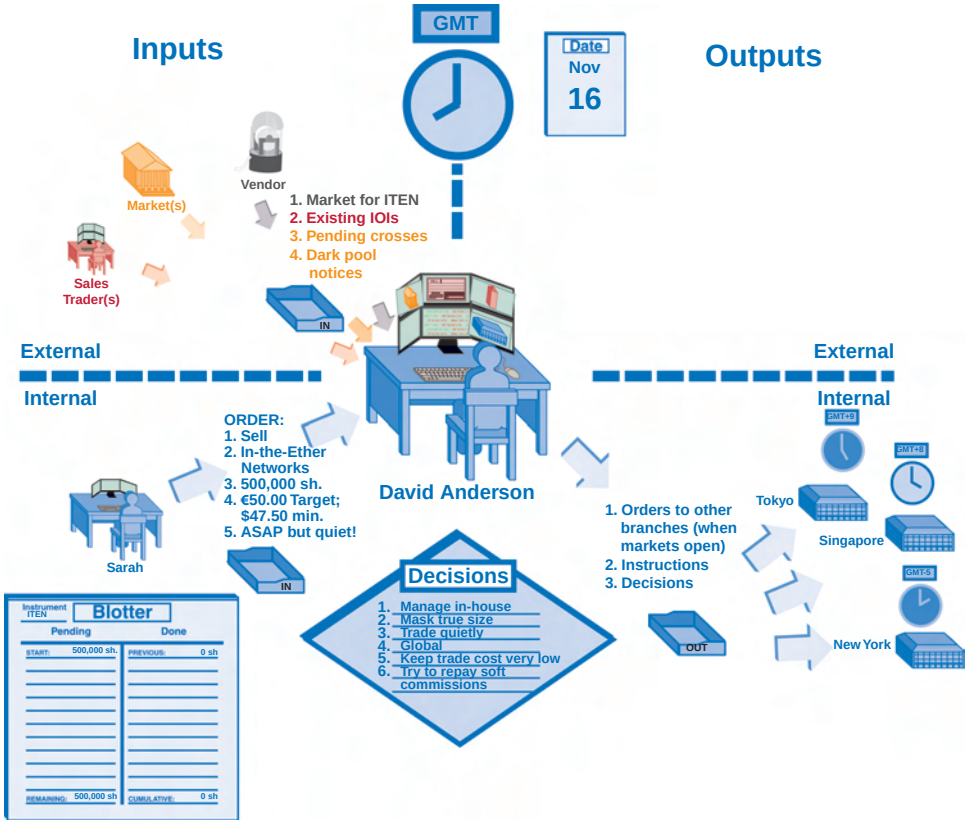

Figure FM.8 ***Buy-side trading*** is finally illustrated through a hypothetical example bringing together the decision process, technology, and interactions in Figure 4.2 of Book 4.

Similar linkages among the graphics in this set of books occur in describing instruments and markets.

As noted previously, a Glossary is included at the end of each book in the set. For convenience, there is a Visual Glossary of the graphical metaphors and elements used in the images for each of the books.

ACKNOWLEDGMENTS

This project began as an attempt to write a history of the markets beginning in the 1960s. There are a number of individuals who held important positions in the trading markets during and after the "backoffice crisis" in the late 1960s who helped me understand the markets early in my career. I thought that a book about them and the work they did to hold the markets together and then reshape those markets would be interesting.

There are several good books describing how Felix Rohatyn, Sandy Weill, and many others worked to bail out firms that were in trouble, but they do not describe the activities that occurred in the backoffice in the midst of the crisis. That book on history did not happen, but these books are my attempt to "pay forward" all the help I received from many different people. The descriptions of the markets in these books are built on the foundation of the knowledge that these people unselfishly imparted. I hope these books will in turn help those entering the markets.

In a real sense, these people and many more than I can list are the true footnotes and references for these books. My earliest teachers included

- Junius "Jay" Peake, University of Northern Colorado, R. Shriver Associates, Pershing and Company, and Shields and Company. (Jay was my first and is still my most influential teacher.)
- Morris Mendelson, The Wharton School of the University of Pennsylvania. (Morris offered Jay and me entre into the academic community, and Jay chose to stay. He and Jay wrote many papers together on market structure and automation, and they allowed me to help with some. Jay and I miss Morris very much.)
- Ray Holland, Triad Securities, A.G. Becker. (For more than 30 years, Ray has been a continuing source of information and advice about the mechanics of the backoffice processes required by the markets.)
- Dick Shriver, R. Shriver Associates. (Dick, my first boss, introduced me to consulting and many in the financial community including Jay. Dick remains a lifelong friend and mentor.)
- Don and Jack Weeden, Weeden & Company, and Fred Siesel, Weeden & Company and the NYSE. (Jay introduced me to Don, Jack, and Fred in the mid-1970s, and for a time we tried to foment a revolution in trading mechanics. Over the period since, they have been a source of information and insight that has helped me understand the way the markets operate.)

More recently, a number of others have provided important views on the workings of the trading process and supporting technology. Most of these people worked with me, or I worked for them on projects that form the basis for the books. These people include the following:

- Mike Atkin, Electronic Data Management (EDM) Council and Financial Information Services Division (FISD). (I have worked with Mike over the past 20 years first at the FISD and later at the EDM Council. Together, we have come to understand the processes required to manage data.)
- Dick Cowles, Telerate and CBOE. (I met Dick at the CBOE, interviewed him at Telerate, and worked with him for USAID as we tried to establish an over-the-counter market in Poland. Along the way, we became friends.)

- Andrew Delaney, A-Team Group. (Andrew taught classes with Craig Shumate and me. Parts of these books related to infrastructure technology, news, and research rely on Andrew's insights.)
- Tom Demchak, Brian Faughnan, SIAC and NYSE Euronext. (Tom, Brian, and their staffs were liaisons on a project to establish a capacity planning methodology for the equity and options markets in the United States and then to understand the impact of the conversion from fractional units of trading to decimals. They explained the issues of managing huge volumes of data message traffic, functions of the technologies that underpin trading markets, and methods for mitigating message volumes in excess of economically manageable capacity.)
- Deb Greenberger, Skyler Technologies and Dow Jones Markets. (In an attempt to resuscitate the Dow Jones Telerate subsidiary, Deb and I visited and interviewed customers in Asia, Europe, and North America to understand how they use data to manage their trading and related businesses.)
- Thomas Haley, NYSE (Tom was a coauthor of *The Creation and Distribution of Securities-Related Information in North America*, a description of the market-data industry that we worked on in 1984. That book presented an explanation of the processes in the market-data industry and was written by Tom with several other industry experts at the time on behalf of the FISD of the Information Industry Association [now known as the Software and Information Industry Association]. I met Tom and the others in the FISD when I served as editor for the book. Tom has been a friend and a constant source of information and advice on the market-data industry ever since.)
- Dan Gray, U.S. Securities and Exchange Commission; Lee Greenhouse, Greenhouse Associates and Citibank; Frank Hathaway, Nasdaq; Ron Jordan, NYSE; and George McCord, McCord Associates. (Dan, Lee, Frank, Ron, George, and I worked with their associates and people from SIAC to define and then specify a methodology for allocating market-data revenues for the different markets that trade NYSE- and Nasdaq-listed securities in the United States. The project caused us to examine the quoting behavior in the markets in great detail and to wrestle with issues such as locked and crossed markets.)
- Sarah Hayes and Kirsti Suutari, Thomson Reuters. (Sarah and Kirsti managed a project in which we visited many major financial centers globally to understand how people trade and the impact of those trading practices on information needs.)
- Alan Kay and Charlie Pyne, On Line Markets. (Alan and Charlie invited me to join them in a project to evaluate the meaning of the information business and how to use information as an entre to create trading venues.)
- Tom Knorring, Chicago Board Options Exchange; Joe Corrigan, Options Price Reporting Authority; and Tom Bendixen, Mark Grinbaum, and Jeff Soule, The International Securities Exchange. (Projects with and for these gentlemen formed the basis of my understanding of the mechanics and economics of the options markets.)
- Don Kittell, SIFMA, NYSE. (Don was the Securities Industry Association [now SIFMA] manager of a series of projects to forecast the impact of the conversion to decimal trading on message volumes. I was fortunate enough to work as a consultant with Don on those projects, where I learned much.)

- Brian McElligott, Kendall Vroman, and Brian's staff, CME Group. (The people at the CME took me to interview important constituencies in the futures markets to understand how they trade and use information.)
- Peter Moss, Thomson Reuters, and John White, State Street Global Advisors. (Peter and John were forceful advocates for these books. They have also been sources of understanding about the issues facing vendors and market-data users.)
- Leonard Mayer, Mayer & Schweitzer. (Lenny attended one of the classes Craig Shumate and I taught on new trading systems. [He should have been teaching me.] He cofounded one of the premier Nasdaq wholesale firms and was gracious enough to help me understand the business of being a dealer.)
- Lance Riley, SRI Consulting. (Lance was my first boss at SRI Consulting, and together we worked on many projects and interviewed countless people over 20 years. I miss Lance greatly.)
- Richard Rosenblatt and Joe Gawronski, Rosenblatt Securities. (Dick and Joe have been kind enough to take me along as they were trading on the floor of the NYSE. They have also shared their insights on the workings of the markets that they write in an ongoing series of white papers for their customers.)
- Craig Shumate, The Morris Group. (I met and worked with Craig at my first job at R. Shriver Associates, and we have worked together constantly since. He brought me into the business of professional training. It is Craig who pioneered the concept of the eight steps in the trading process and "Playing the Game" as a way to draw together all the aspects of trading in a single process description.)
- Herbie Skeete, Mondovisione and Thomson Reuters. (I met Herbie in London at least 20 years ago, and I try to see him every time I am in London or when he comes to the States. He is a wealth of information on market data and knows a huge number of people. Herbie introduced me to Elsevier and is responsible for my writing these books.)
- Al Thomson, Instinet; Lynch, Jones and Ryan; and AutEx. (Al and I have been collaborators and friends from my earliest work in the trading markets. He set up a great many of the interviews and provided insights that underlie the knowledge presented in these books.)
- Wayne Wagner, The Plexus Group (JPMorgan). (Wayne invited me into a project for the Department of Labor on the meaning of "best execution" in the early 1990s. He patiently explained how many different buy-side motivations resulted in very different expectations from trades.)

I am not able to remember and therefore thank all those that I have interviewed and the many others who worked at the firms for which I consulted for more than 35 years. (By my best estimate, I have averaged several hundred interviews each year since 1974. Therefore, the total number of interviews and thus people to whom I am indebted numbers in the thousands.) Rather than name a few and forget many, I would simply like to thank them all. This book is dedicated to them and most particularly to Joseph Gawronski, Richard Rosenblatt, and Wayne Wagner.

Preface

This book is the second in a set of books that address the trading markets. We use the term "trading markets" because that is the most general term we can find for the portion of the financial markets sometimes imprecisely referred to as the "securities markets." (We explain these distinctions later when we describe instruments in Part 3.) The focus here is on the activities of investing, trading, market mechanisms, the instruments traded, and the processes required to make the markets work.

We begin our investigation by examining how differences in investment strategy and style create different types of trading decisions, orders, and market choices. With this as a background, we explore trading first by defining some common concepts used to describe and evaluate trading and then by addressing the activities surrounding the decision to send an order to buy or to sell to some marketplace where it can be executed, resulting in a trade. Trading is the signature feature that underlies all the books in this set.

Following the discussion of trading, we examine how markets work. Book 1, *An Introduction to Trading in the Financial Markets: Market Basics,* examines definitions of markets, the ways trading venues are organized, and some of the functions required to operate in a market. In Part 2 of this book, we look at market structure and the interactions of principals, agents, and market venues. Markets operate using two primary formats—physical and electronic—as well as combinations of the two. We describe the mechanics that produce executions and tools that support them. We conclude by examining the factors that affect liquidity in markets.

We move on to explore the general characteristics of the instruments traded in the markets. In Book 1, we provided a brief introduction to instruments, including a description of the cash flows each broad instrument type generates over its life. For each instrument described in Part 3 of this book, we look at the elements present in the instrument, the common measures used to describe and evaluate each instrument, the categories of instruments, the investors and traders that participate in the market or markets for each instrument, and the characteristics of the markets in which the instruments are traded.

Up to now, we have described markets as if all instruments trade in markets that operate the same. This is not true. Very different market structures exist for various instruments. Even similar instruments, such as a number of types of fixed-income (fixed interest) instruments, trade in markets with different attributes. Part 3 looks at the types, format, mechanics, and structure of important instrument markets.

Finally, we explore the processes of the trading markets. Many hundreds or even thousands of different processes are employed within the trading markets. It is

not possible to cover them all, particularly because many may be unique to individual companies or special circumstances. We describe the most important processes involved in trading and also focus on some important supporting processes.

Before investigating trading, instruments, and processes, we begin with a high-level overview of the concepts presented throughout this set. The goal of it is to provide someone new to the trading markets, and those who have not read the other books in the set, enough background to follow the discussion in the remainder of this book. If you are familiar with the basics of the markets, you might want to skip to Part 1.

This book presents the primary explanation of investing and trading, markets, instruments, and processes. Nevertheless, what is here relates to discussions in the others in the set. Figure FM.9 shows this book's content as it relates to information in the other three books.

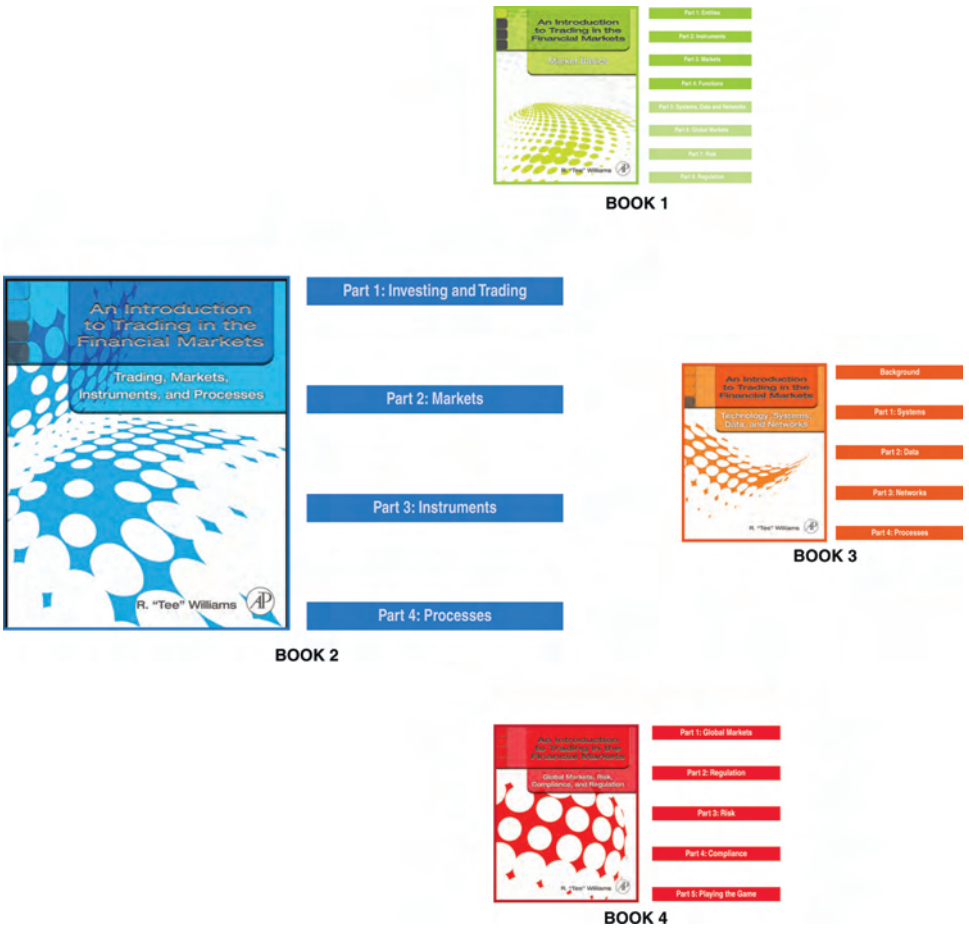

Figure FM.9 The topics in this book and other books in the set.

Overview

The unique feature of the subject matter in this book, as well as the other books in this set, is that we describe the activities related to and in support of trading in ***instruments: stocks***, ***bonds***, ***options***, ***futures***, ***currencies***, and ***commodities***. We divide instruments in additional ways. ***Securities*** (stocks and bonds) are instruments used to raise money for entities. We categorize securities as an important subdivision of a larger category of ***cash markets***. In addition to securities, cash markets include trading in currencies and commodities. In effect, we mean by cash market that we are actually buying a thing—a stock, a bond, and so on. We contrast cash markets with ***derivatives***.[1] Derivatives are instruments that *derive* their value from other instruments or things. Derivatives are primarily used for managing ***risk*** or to make a limited gamble on expected future market activity without expending the full investment commitment required in the cash market. Derivatives represent a ***contingent claim*** created by a contract in which one party agrees to perform a service or deliver an instrument in the future if certain conditions are met as defined in the agreement. The traded instruments described in these books are exact or near substitutes for each other. The term ***fungible*** is a characteristic of instruments that are "exact or near substitutes" for one another. For example, one share of Siemens is identical to any other, or one futures contract on a U.S. Treasury bond is indistinguishable from another contract on the same instrument. Trading fungible instruments separates the markets we are considering from markets that are not fungible, such as real estate. Although both types of markets share some similarity, real estate is not fungible because no two pieces of real estate are exactly similar, and this dissimilarity affects the value of the land, house, or building.

In the remainder of this section, we provide a brief overview of the elements of trading markets covered in the other books in this set before we explore the business of trading, markets, instruments, and processes in more detail (see Figure OV.1). If you want more information about the topics covered briefly here, we invite you to explore the other books in the set. The topics in this section follow in general sequence the major sections of the other books in the set.

1 In the United States, the concept of a "security" has become somewhat muddled. Options, which we do not classify as securities, are treated as securities because the Securities and Exchange Commission governs them. You will find this kind of confusion or lack of precision common in the trading markets.

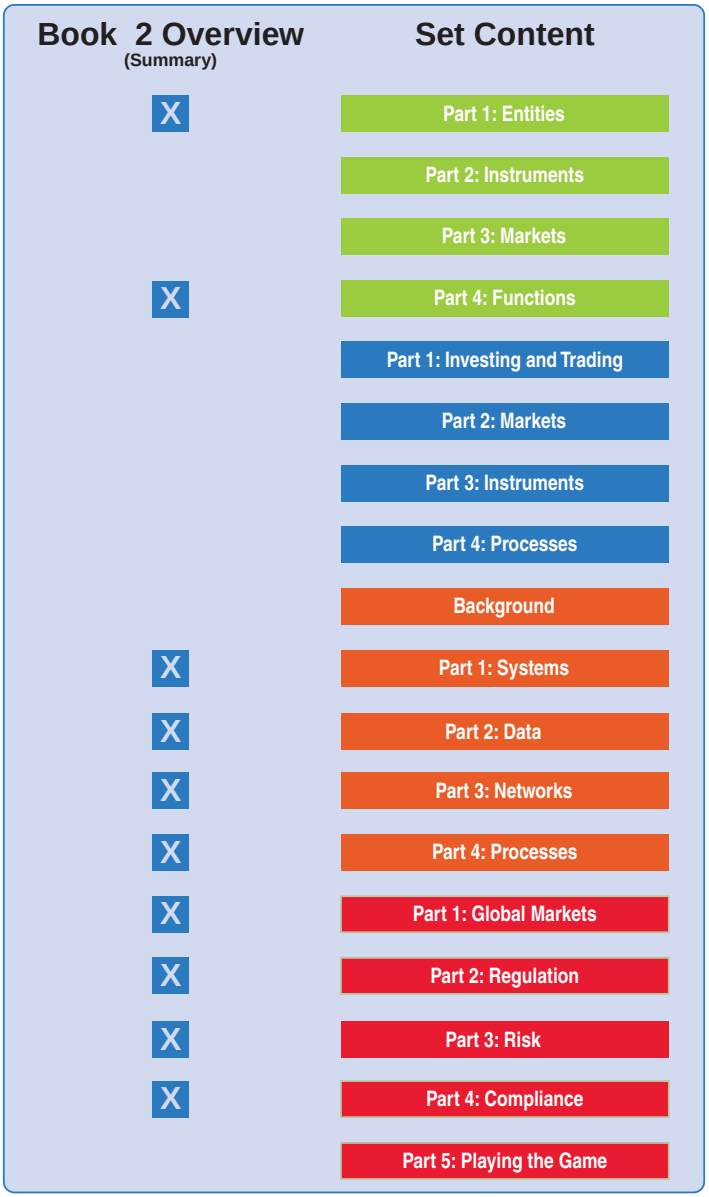

Figure OV.1 Major topics in the overview.

TAXONOMY OF MARKETS

We want to make an important distinction between markets and marketplaces. As we use the term, ***market*** means all the activities related to buying and selling a specific type of financial asset or instrument such as a stock or bond. A ***marketplace*** is a physical location, such as the New York Stock Exchange building in lower New York City, or a logical location, such as the Xetra computerized trading system of Deutsche

Börse, where trading actually happens. As we will see, markets include the trading activity, but also many more activities. We also use the general term ***trading venue*** to indicate any type of entity or location where executions occur. We have adopted the generalized term "trading venue" to encompass both marketplaces organized as exchanges and marketplaces organized as ***brokers***, such as ***electronic communications networks*** (ECNs in the United States) and ***multilateral trading facilities*** (MTFs in Europe.)

Within the general term "market," there are two components for those instruments that are securities (see Figure OV.2). The first component, referred to as the ***primary market***, involves the process of creating the security and raising money for

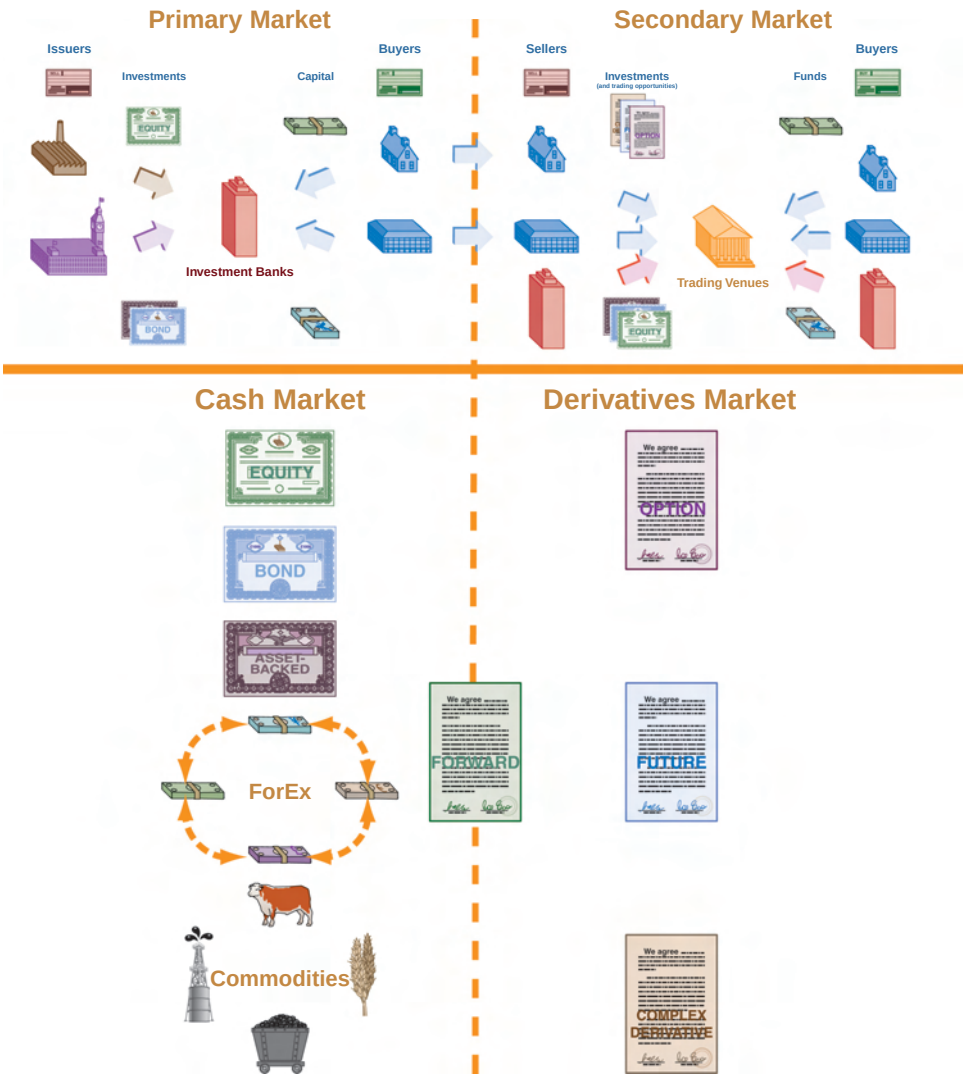

Figure OV.2 ***Markets*** segment into primary versus secondary and cash versus derivative to highlight different aspects of their purpose.

entities such as commercial companies, governmental bodies, or ***nongovernmental organizations*** (NGOs) that issue securities. Instruments that are not securities are not generally said to have a primary market. Trading in instruments takes place in the ***secondary market*** after the instruments have been created. When a security, stock, or bond for a company such as AstraZeneca, Microsoft, or Sony is created in the primary market, the revenue produced when the security is first sold goes to the company that issues the security. After a security is issued and is trading in the secondary market, the revenue generated from a sale goes to the seller of the security, not to the entity that initially issued the security. In fact, the reason for secondary markets is to permit those who buy ***new issues*** of a security to end or reduce their ownership of a bond (before it matures) or a stock so long as the company continues to be in business.

ENTITIES

In most countries, the entities in the traded-instrument markets are highly regulated commercial organizations in which there are both activities that must be performed (e.g., treating a customer fairly) and other activities in which firms may not engage (e.g., trading on information not publicly available to others in the market). In the past 20 years, the unique characteristics of entities in specific countries have been diluted as large numbers of firms have merged across national borders, or firms have won the right to be registered in other countries.

Figure OV.3 provides a representation of some terms and distinctions for the different entities involved in the trading markets. We use the metaphor of *the Street*

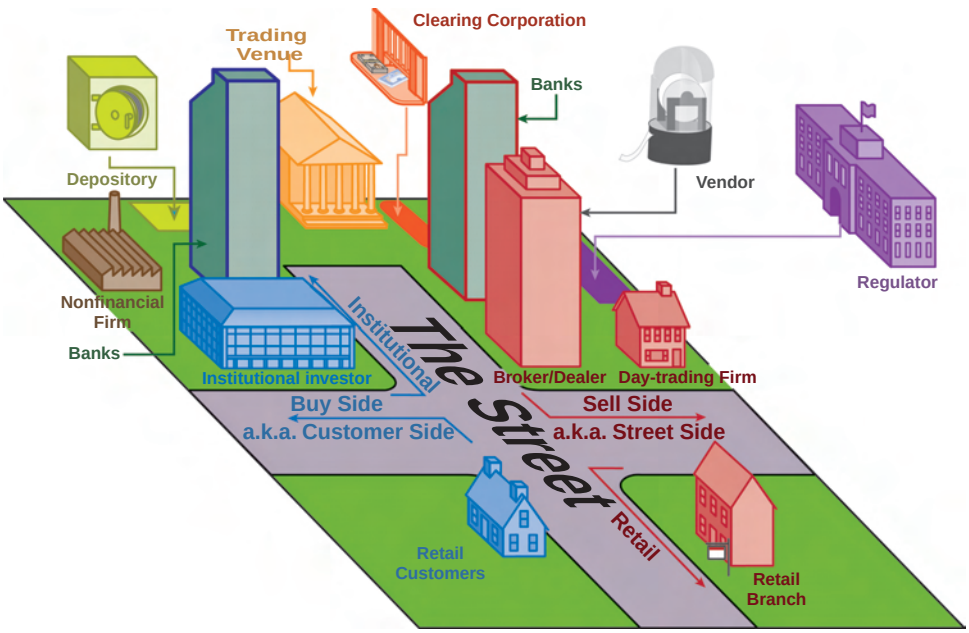

Figure OV.3 ***Market entities*** include individuals and institutions that invest, intermediaries, and supporting organizations that together comprise the activities of the Street.

to represent entities. Entities were covered in Book 1, *An Introduction to Trading in the Financial Markets: Market Basics*.

The entities in the trading markets are grouped into individuals and organizations that invest money, commonly called the ***buy side***, and organizations that provide ***intermediary*** services, referred to as the ***sell side***. A third group includes marketplaces and entities providing supporting services. The terms "buy side" and "sell side" do not mean that one group is buying securities and the other side is selling. Rather, the terms refer to the fact that one group (the buy side) is buying or consuming the trading services while the other group is providing or selling those services. We are not sure of the exact origin of these terms, but they are either in common usage or at least understood in most of the world.

The buy side can be divided into ***retail investors*** and ***institutional investors***. The term "retail investor" refers to individuals participating in the markets directly. By contrast, the term "institution" refers to an organization that operates in the markets professionally. An institution may represent the money for a group of individuals, as in the case of a mutual fund or unit trust, but a professional makes investment and trading decisions on behalf of the individuals who have entrusted their money to the institution. Broker/dealers (the sell side) often split their operations into retail and institutional departments, each supporting the corresponding portion of the buy side.

Exchanges and other trading venues are entities that provide a facility for executing trades. Finally, a number of supporting entities such as ***banks***, ***clearing corporations***, and ***depositories*** facilitate the trading process. If you need a better understanding of the entities in the trading markets, you are invited to review Part 1 of Book 1. In this book, we examine the structure of markets in Part 2 and the types of markets for each instrument type in Part 3. Finally, Part 4 of this book examines the interaction of different functions within the entities in the primary and secondary markets.

INSTRUMENTS

In Part 3 of this book, we expand on our description of instruments presented in Book 1 of this set, *An Introduction to Trading in the Financial Markets*: *Market Basics,* by explaining some of the major attributes and variations found in different types of instruments. We also describe the characteristics of the markets in which different instruments trade. Therefore, we do not repeat descriptions from Book 1 except to note that instruments are the products traded in the markets we are exploring. We use the general term "instruments" to include securities, contracts, currencies, and commodities that are actively traded.

FUNCTIONS

Within the entities introduced previously, many roles or functions are performed by individuals and departments within the firms. As with entities, they can be grouped into buy-side and sell-side functions as well as support functions. Almost every one of these functions has unique, dedicated technology support described later. Figure OV.4 depicts these functions. Many large financial firms have individuals, groups, or departments that perform most of these functions.

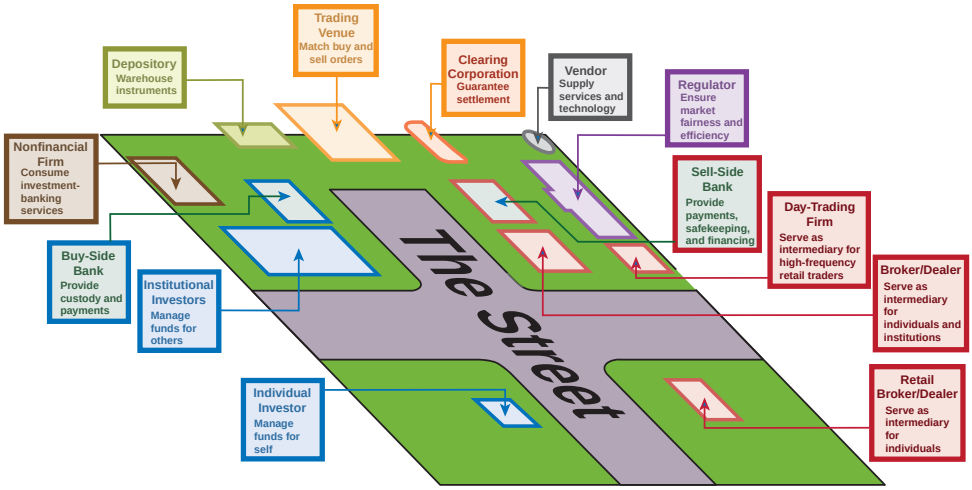

Figure OV.4 ***The trading markets*** are composed of the functions of the buy side, sell side, trading venues, and supporting entities that interact to permit the exchange of traded instruments.

Buy Side

The primary buy-side functions include ***portfolio management***, ***research***, and ***trading*** (see Figure OV.5). These functions are often referred to as the ***front office***. An additional front-office activity is ***sales*** of the investment service to customers. In the financial markets, the term "front office" is not always used consistently but generally refers to "customer-facing" activities. An emerging term, ***middle office***, is not always used consistently, but we define it as support for customers, such as ***customer accounting*** and reporting and ***compliance***. ***Backoffice*** functions

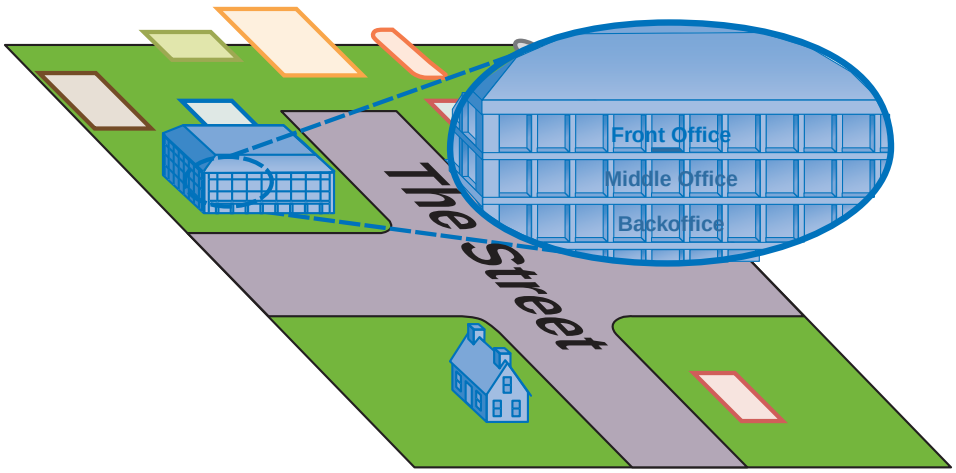

Figure OV.5 ***Buy-side functions*** facilitate profiting from owning and sometimes trading instruments that change in market price and may generate income for the individual and/or a firm and its customers.

represent the activities that are required to support the front office and any reporting that may be required to satisfy regulatory obligations. Among the backoffice functions are activities related to holdings not directly belonging to customers and interactions with the markets. Individuals may actually perform most of these functions themselves on a rudimentary level supported by their agents.

Sell Side

The functions of the sell side are often referred to as intermediary functions (see Figure OV.6). An intermediary stands between the customer and markets, introducing the customer to the market. The intermediary has two fundamental, subsidiary functions: ***customer activities*** and ***market activities***.

Customer activities can be further divided into retail services and services for institutional investors. In turn, institutional activities include ***investment research***, ***institutional sales***, and ***sales trading***. These customer activities are also referred to as front-office activities because they are on the buy side. ***Customer-side accounting*** supports front-office customer activities, and we define them as middle-office functions. Perhaps the most significant sell-side functional distinction within the trading markets is between the role of broker and ***dealer***. A broker, also known as an ***agent***, stands as a representative of a ***principal***, usually a customer. The broker is expected to act on behalf of his or her principal and in the principal's best interest.

By contrast, a dealer as a principal is expected only to look out for himself or herself. Dealers act for themselves in the markets, attempting to profit from their actions. The term ***broker/dealer*** indicates a firm that is permitted to act both as a

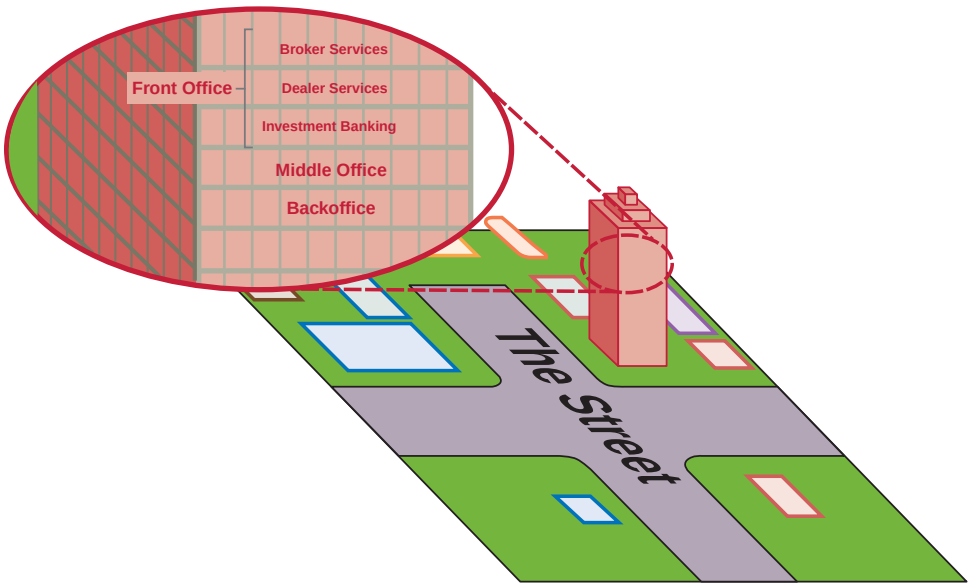

Figure OV.6 ***Sell-side functions*** generate revenues from acting as an intermediary for buy-side customers.

broker and a dealer. In most markets, firms are not permitted to act as broker and dealer in the same transaction.

Market-related activities are also known as ***street-side functions*** (i.e., "street-side" as in facing the Street) and relate to a firm's interaction with the markets and with other firms. ***Position management*** refers to the firm's management of investments on its own and customers' accounts in specific securities. ***Proprietary trading***, ***arbitrage***, and ***treasury*** are activities in which the firm manages its own capital for risk management, for profit, and to conform with capital obligations. The support activities on the street side include ***purchases and sales*** (resolving completed trades), the ***cashier*** (managing the funds involved in trades), and the ***cage*** (managing securities and other instruments). An important function of the cage is ***segregation*** of securities—keeping track of both ownership and any ***liens*** on instrument ***positions***.

The sell side has a compliance department that ensures customers are treated fairly and in accordance both with market and national regulations, and with customer wishes. On the street side, the compliance department makes certain that all trading rules and regulations are observed and the firm maintains all ***required minimum capital*** positions.

Market

Markets are economic entities with a staff supporting a physical trading floor or an electronic facility that causes the markets to function. These functions within trading venues serve to support the trading process; collect, distribute, and generate revenues from the information produced by the market; regulate the market and its members or participants; promote and sell the market services; and solicit and manage listings of companies that elect to have their instruments traded on the market. Not all markets provide all these services, and some markets provide other specialized functions. Figure OV.7 presents a representative summary of these functions.

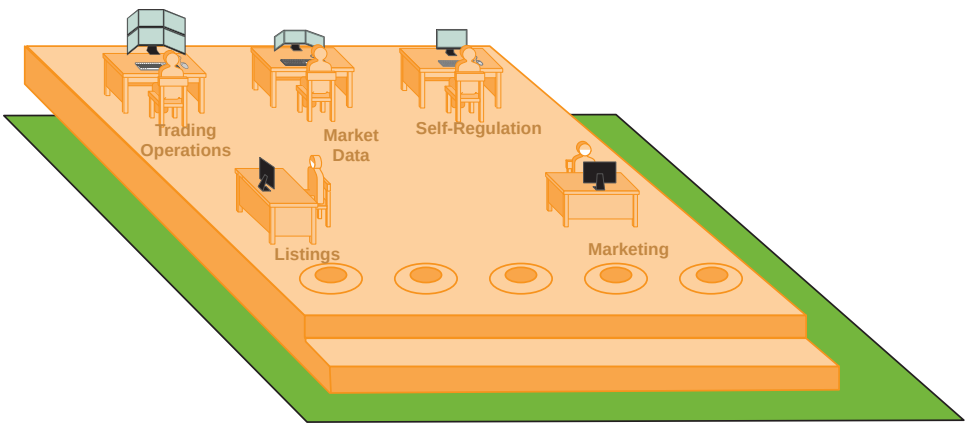

Figure OV.7 ***Market functions*** permit trading venues to match orders to buy instruments with orders to sell for traders seeking to exchange instrument and cash positions.

Support

A number of functions are required in support of the trading markets as shown in Figure OV.8. In many markets, these functions require the entity be registered as a special-purpose organization such as a broker/dealer, an exchange, or a bank. Registration provides the right to conduct certain activities and prohibits engaging in other activities.

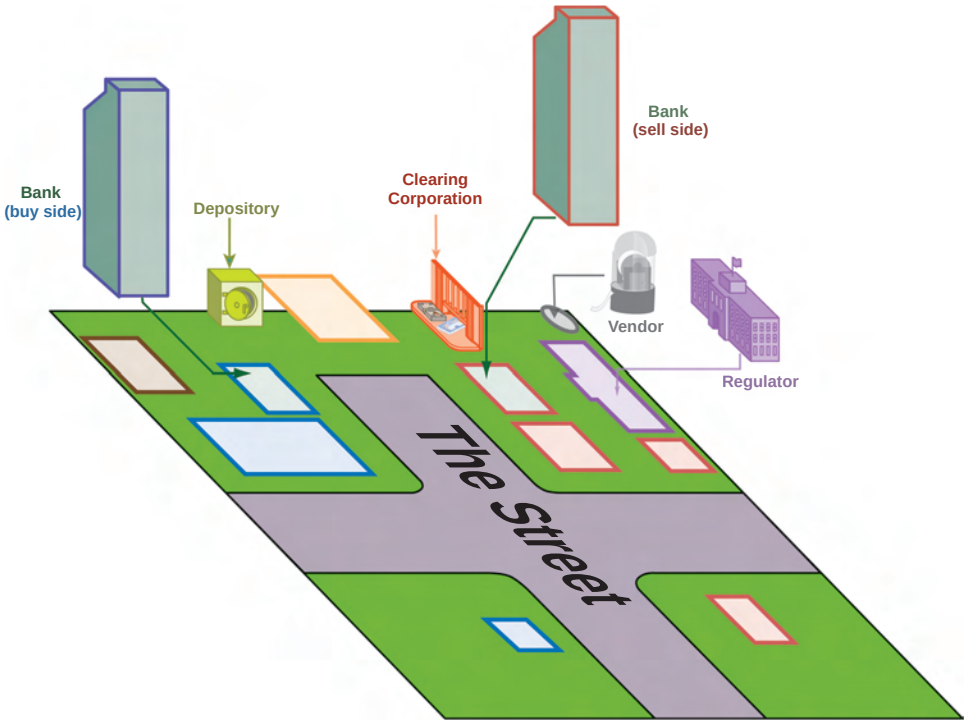

Figure OV.8 ***Support functions*** enable the exchange of instruments for cash among direct market participants.

A ***correspondent*** broker/dealer is a specialized intermediary that provides support functions to other broker/dealers that choose not to perform those activities for themselves. An ***interdealer broker*** (IDB) operates between two dealers on large trades. A firm providing the services of a correspondent and/or an IDB is also termed a ***brokers' broker***.

Other support activities involve banks serving as ***custodians***, holding securities on a customer's behalf. Banks also serve as ***transfer agents***, recording security ownership, and ***paying agents***, making dividend and interest payments.

Clearing corporations are independent entities or extensions of exchanges that resolve any issues between buyer and seller or their intermediaries to ensure the instruments purchased and the money to be paid are delivered at the time and place as the market custom dictates or as agreed by the parties. ***Depositories***

warehouse certificates or act as registries of instrument ownership. When trades occur in markets with depositories, the transfer of ownership usually takes place by electronic bookkeeping transfers within the depository.

Vendors provide data and systems in support of the trading process.

The discussion to this point in this book's overview has been a recap of the content of Book 1 with an emphasis on subjects not described in this book. This book describes investing, trading, markets, instruments, and processes, which are not summarized here. A brief summary of the content of Books 3 and 4 follows.

TECHNOLOGY

Technology has been one of the primary forces shaping the trading markets from their inception. In the earliest markets, the absence of technology meant that a principal who wanted to discover prices or transmit a wish to trade had to be physically present at an exchange, coffeehouse, or tavern to find out the market price and find other traders. In the 1860s, the stock ticker was developed, which meant prices could be disseminated to remote locations, but orders still had to come back to the market for execution. Now the technology that underlies the markets falls into three major categories: ***systems***, ***data***, and ***networks*** (see Figure OV.9). Although we discuss the general categories, the number and diversity of specific technologies within the industry are vast.

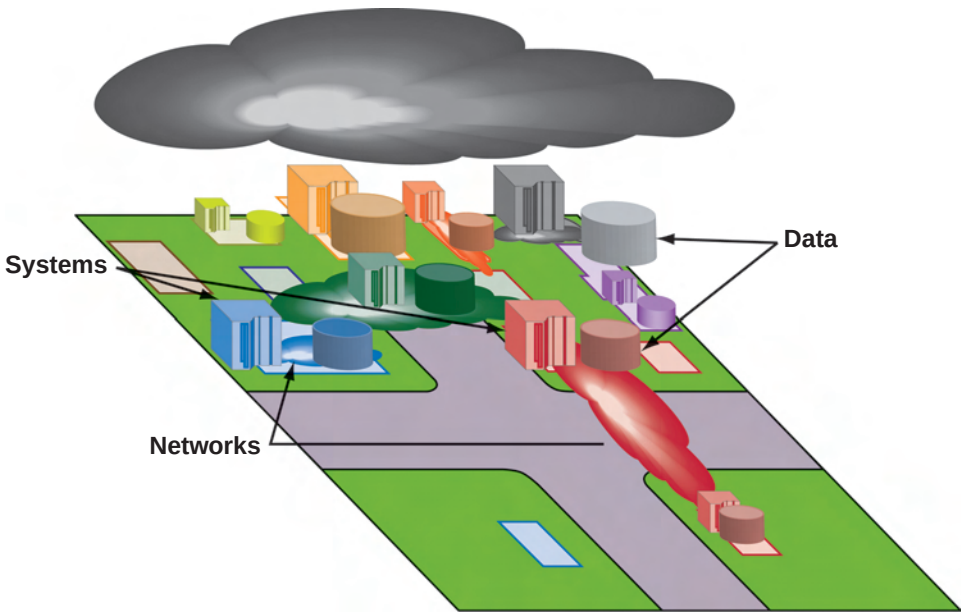

Figure OV.9 ***Technology*** is composed of the *trading-market systems, data,* and *networks* that underpin all activities in the trading markets.

Systems

Systems in the trading markets can be thought of as relating primarily to customers and/or accounts, instruments, and processes. In general, the purpose of systems is to report on positions or the status of transactions to those who need to know. The interested parties are customers, also known as ***beneficial owners***, intermediaries, ***regulators***, and ***shareholders*** or ***partners*** of firms that operate in the markets. Traditionally, the output of systems was printed reports. Now, however, information is increasingly presented on real-time ***market-data*** displays often connected to the systems through the Internet or private networks. The classes of systems are represented by functional area in Figure OV.9.

A number of the systems used in the trading markets must process data that changes moment to moment. This type of system places unique demands on the design, both to be able to process huge flows of information and to continually react instantaneously to events as they occur.

A dedicated staff within each organization generally maintains the systems, and as systems have become more complicated, it is common for the systems department to specialize by function within the firm. Systems departments often report to a single ***Chief Technology Officer*** with responsibility for the entire organization. Large global organizations sometimes separate the technology function by region, whereas others focus by major department or line of business.

Data

Data in the trading markets generally is produced by and may support the various systems described previously (refer to Figure OV.9). Data has historically been maintained within each system that used the data, but this resulted in duplicate data and the strong possibility that data elements would not be consistent across systems. Now increasingly data is maintained in ***data warehouses*** where data is shared by multiple systems and is managed independently of those systems.

Data for the trading markets, to a greater extent than most other commercial organizations, falls into static data that changes infrequently and real-time data that changes instantaneously. Data that changes infrequently generally relates to details about specific instruments, accounts, and positions. Data that is dynamic tends to relate to prices and transactions in the markets. As we have noted repeatedly, terminology in the trading markets is imprecise. Although some people use the term “market data” to mean real-time data, we define market data as data coming from the markets in contrast to data produced within a firm. Market data also includes news in electronic form. As trading becomes more automated, market data that comes directly from electronic market systems is often subject to execution. This information is sometimes referred to as ***actionable market data***.

Networks

Networks have increasingly replaced physical distribution as a means of moving both information and reports within the trading markets. Since the mid-1990s, the public Internet has become increasingly important as both a retail and institutional commu-

nications medium. Networks tend to be specialized by function. Important categories are networks for routing orders, networks for routing market data, and networks for moving positions and funds. There are also specialty networks for status notification and for indicating interest in trading (refer to Figure OV.9).

Three major categories of networks exist in the trading markets. The first category is the market-data network generally provided by market-data vendors such as Bloomberg, Interactive Data, and Thomson Reuters. The second category is the enterprise distribution infrastructure. Enterprise infrastructure represents specialized local-area and wide-area distribution networks that permit information to move seamlessly throughout global financial organizations. The third network category provides dedicated order routing among firms and between firms and marketplaces. This latter category has been greatly enhanced by the development of the ***Financial Information eXchange (FIX)*** protocol beginning in the early 1990s. Other specialty networks provide a variety of services.

As with systems and data, networks and communications have become areas of specialty in most firms. Within the general area are the specialties of ***capacity planning***, ***bandwidth acquisition***, and ***network design***. Often the process is to choose among commercial offerings with differing capabilities instead of designing bespoke networks. The ***Chief Communications Officer*** often heads enterprise-wide communications activities.

The next four sections correlate to the major content of Book 4, *An Introduction to Trading in the Financial Markets: Global Markets, Risk Compliance, and Regulation*.

GLOBAL MARKETS

Since the 1960s, there have been three major international financial centers, and most of the rest of the world's trading markets have revolved around those centers. Tokyo was the major financial center in Asia for most of the past 40 years; however, restrictive financial regulation in Tokyo and high local communications costs in Japan caused Hong Kong and Singapore to become coequal centers for firms seeking an Asian headquarters location. In Europe, London was a primary financial center for more than two centuries, but other European centers became rivals prior to ***Big Bang*** in 1986. More liberal policies following Big Bang permitted London to resume its dominance. Eurex has made Germany a critical market in futures. New York has been the dominant market in the Americas, with the exception of futures markets that center in Chicago.

Beyond the dominant global market centers, there are a number of important regional markets. In Asia, Jakarta, Manila, Seoul, and Sydney are important regional markets, and smaller centers are growing in Bangkok, Kuala Lumpur, Mumbai, and Shanghai. Amsterdam, Frankfurt, Paris, and Milan are important centers in Europe, while Copenhagen, Helsinki, Oslo, and Stockholm represent a coordinated regional submarket known as the “Scandinavian markets.”

For the Americas, in addition to New York and Chicago, Boston and Philadelphia have important U.S. centers, and Mexico City, Montréal, São Paulo, and Toronto are important non-U.S. regional centers. In Africa, Cairo and Johannesburg are important markets. Dubai and Tel Aviv are markets rapidly gaining importance in the Middle East. In addition to the centers of trading, Basel, Boston, Edinburgh, Geneva, and Zurich have large concentrations of investment management activities.

An important factor in the global markets is the way firms and departments within interact with markets and other entities outside their local market (see Figure OV.10). The way firms trade in a global marketplace is an important discussion that will be available in Book 4.

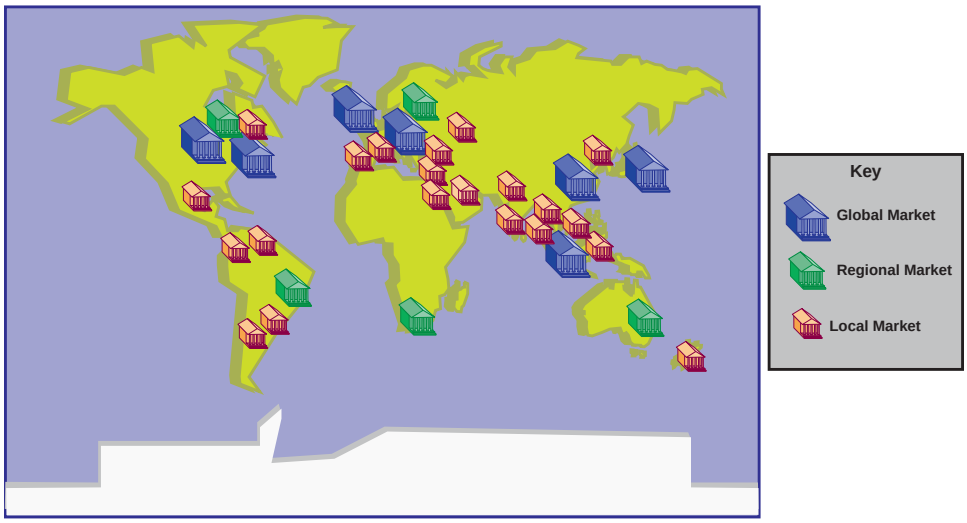

Figure OV.10 ***Global markets*** interact with regional and local markets to permit both local and international trading for market participants.

RISK MANAGEMENT

More than most economic enterprises, the management of most financial firms has the responsibility to protect the firm from unanticipated events that can negatively affect the future of the firm itself, the assets for which the firm is responsible, or its customers. Risk management in the trading markets is extremely complex because firms face risk from conditions in the market, from the financial stability of other firms it deals with in the markets, as a result of credit conditions because all financial firms use credit to fund their daily operations, from correlations and contingencies within the holdings, and from rare events such as liquidity problems that can cause otherwise secure firms to be unable to meet their obligations.

Risk management involves both trying to understand these risks—to quantify them if possible—and to take actions to ameliorate possible negative impacts. One widely used risk-management measure known as ***value at risk*** (VaR) reduces

risk to a single measure that attempts to quantify risk by expressing how much of the value a portfolio or trading position is at risk of being lost over a trading day, an overnight period, or a weekend as a result of historic or conceivable market, political, or economic events.

Problems created during the global market crisis in the autumn of 2008 have brought into question highly simplified measures of risk. Most commentators suggest that risk measures are best thought of in the context of a broader analysis. The measures are one element that can be combined with qualitative analysis of market conditions and knowledge of the position or portfolio to create an overall picture of risk.

REGULATION

Regulation is highly dependent on national law and custom; however, most regulation in the financial markets evolved from ***self-regulation***. Self-regulation evolved within markets as members and participants were forced to develop rules and procedures to govern activities. In many cases, countries have developed national regulation to correct problems that have occurred, promote the national economy, and protect citizens. In places where there are strong political subdivisions within the country, such as the states in the United States and provinces in Canada, there also may be regulation on the state/province level. In the European Union, each country has its own market regulations. The EU attempts to harmonize these rules so that firms can do business in any of the member countries guided by consistent regulations.

General categories of regulation include the regulation and governance of banks, broker/dealers, and investment institutions; the protection of investors in a market; control of market structure; and control and protection of national markets.

Following are some of the issues of concern to regulators:

- **Transparency:** The rules requiring transactions, volumes, and prices to be publicly reported.
- **Best execution:** Requirements that force or encourage an intermediary to seek the best possible price for a customer on each transaction.
- **Competitive parity:** Regulations that seek to ensure that competitive organizations are subject to the same requirements and regulatory burdens when performing the same activities within a single competitive environment.
- **National market protection:** Protection of both local investors and institutions from foreign entities that might damage what is perceived to be national interest.

Two fundamental approaches to regulation are prevalent in the world today. The first, typified by the European Union and much of the British Commonwealth countries, can be categorized as regulation based on principles. The idea of principle-based regulation is that general principles related to a number of important issues are laid down, and regulations are crafted to accomplish those principles. In

specific instances, the courts or arbitrators assess whether the action in question violates the broad principles. By contrast, regulation in the United States is based on rules that result from the correction of wrongdoing. When a problem occurs under this regulatory model, specific laws or regulations are enacted to forbid that behavior in the future. Other countries throughout the world tend to fall more or less into one category or the other based on culture and the influence of other countries.

COMPLIANCE

Compliance is the activity within financial entities—investment firms, broker/dealers, market centers, and support organizations—charged with making sure that the entities comply with their obligations to regulators, customers, and other parties affected by the entities' business operations. The three most critical compliance functions are as follows:

1. To ensure that the functions performed by an entity are in accordance with external regulations from markets and national regulators;
2. To make certain that the organization operates in accordance with wishes and requirements imposed by its customers; and
3. To ensure that the entity conforms to its own internal policies and rules, which its managers, directors, and shareholders establish.

Customers often impose requirements on entities related to either the investment philosophy or moral beliefs of the customers. Examples of customer requirements include prohibitions on investments related to gambling, tobacco, and alcohol because of the moral views of the beneficial owner. Investment requirements might include guaranteeing set performance guidelines or avoiding unacceptable risks. Internal rules and policies have more to do with principles that may be formalized in charters and mission statements, whereas other rules are created by defining business practices that an organization believes will make it successful. Examples can include charters that define the investment philosophy of a fund or rules in which portfolio managers are not permitted to submit orders to the market directly.

This section explains some of the visual cues that are found in the figures throughout this book in particular, but many are found in the other books in this set as well.

The entities on the Street all have different colors to differentiate them (see Figure VG.1). These colors are used throughout the set to distinguish functions, processes, and attributes related to specific groups of entities. Note that banks while green have either a blue or red stroke to denote that banks perform different functions for the buy side and sell side. The icons representing many attributes are color coded to reflect the entity that they represent.

Figure VG.1 The meanings of various colors are shown in this graphic.

PREFACE

The book images with boxes indicating the major areas of content are used throughout the set to suggest areas of interest and to map sections with related content (see Figure VG.2). The current book (i.e., Book 2) is larger than the others. The content boxes do not include incidental sections such as the Preface or Overview.

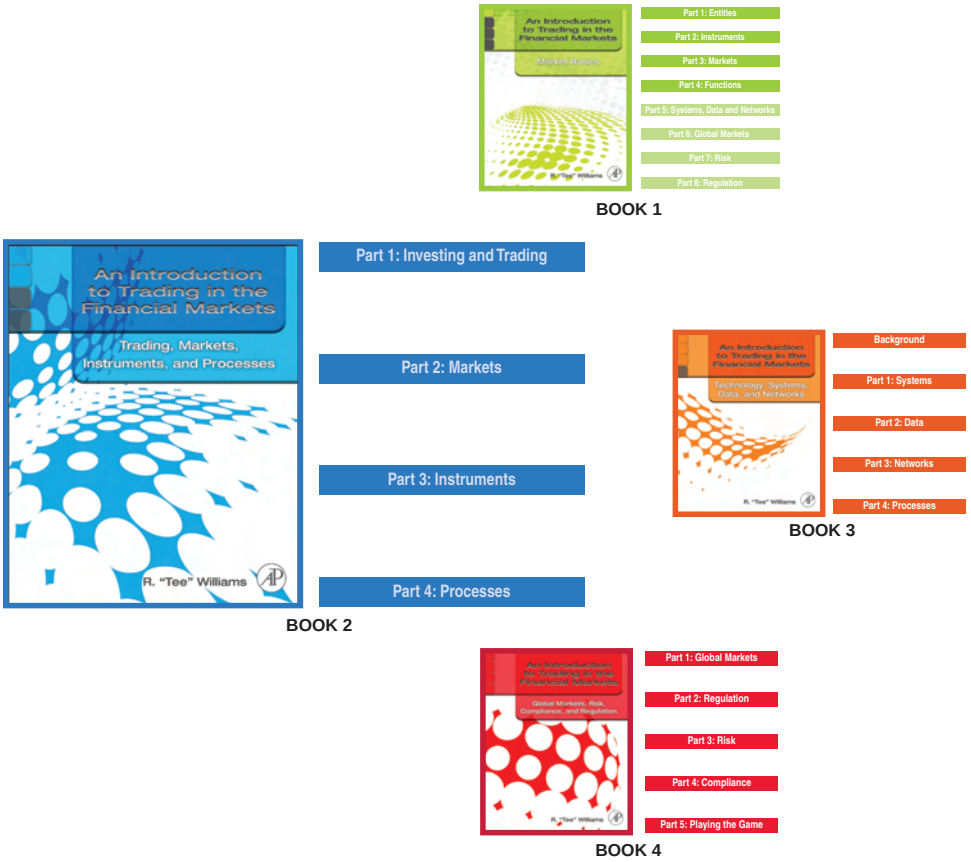

Figure VG.2 Book icons

OVERVIEW

Figure VG.3 shows how subjects covered in the Overview of Book 2 relate to the content in Books 1, 3, and 4.

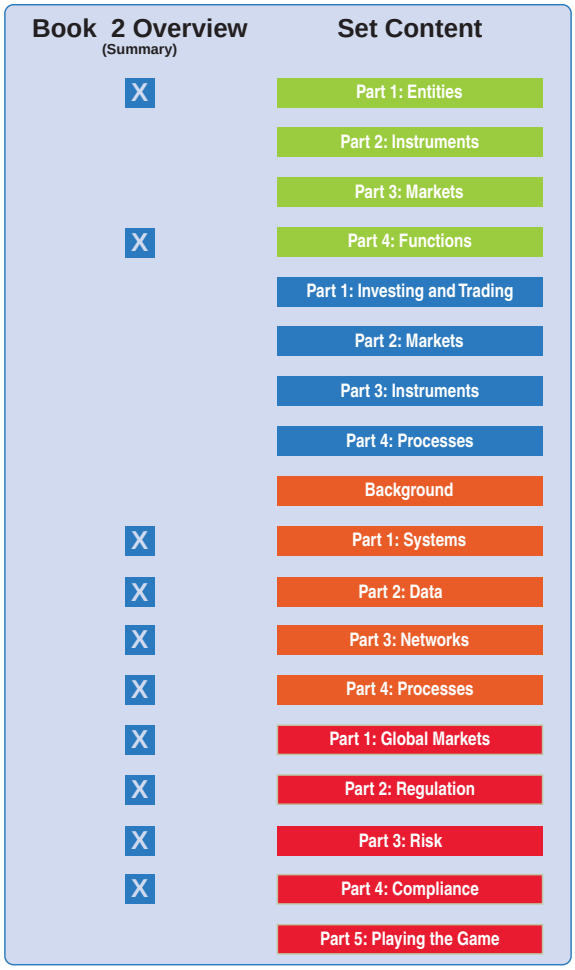

Figure VG.3 The relationship between the content in the Overview and in the set.

We distinguish among markets in Figure VG.4 in two fundamental ways. At the top we show that the primary market on the left creates new issues from issuers and distributes those issues to first-time owners. In the secondary market on the right, owners—both those who purchase an issue from an initial public offering (IPO) and subsequent holders—are able to sell holdings they no longer want to willing purchasers. At the bottom we distinguish between instruments in the cash market, where instruments have intrinsic value in themselves, and the derivatives that trade

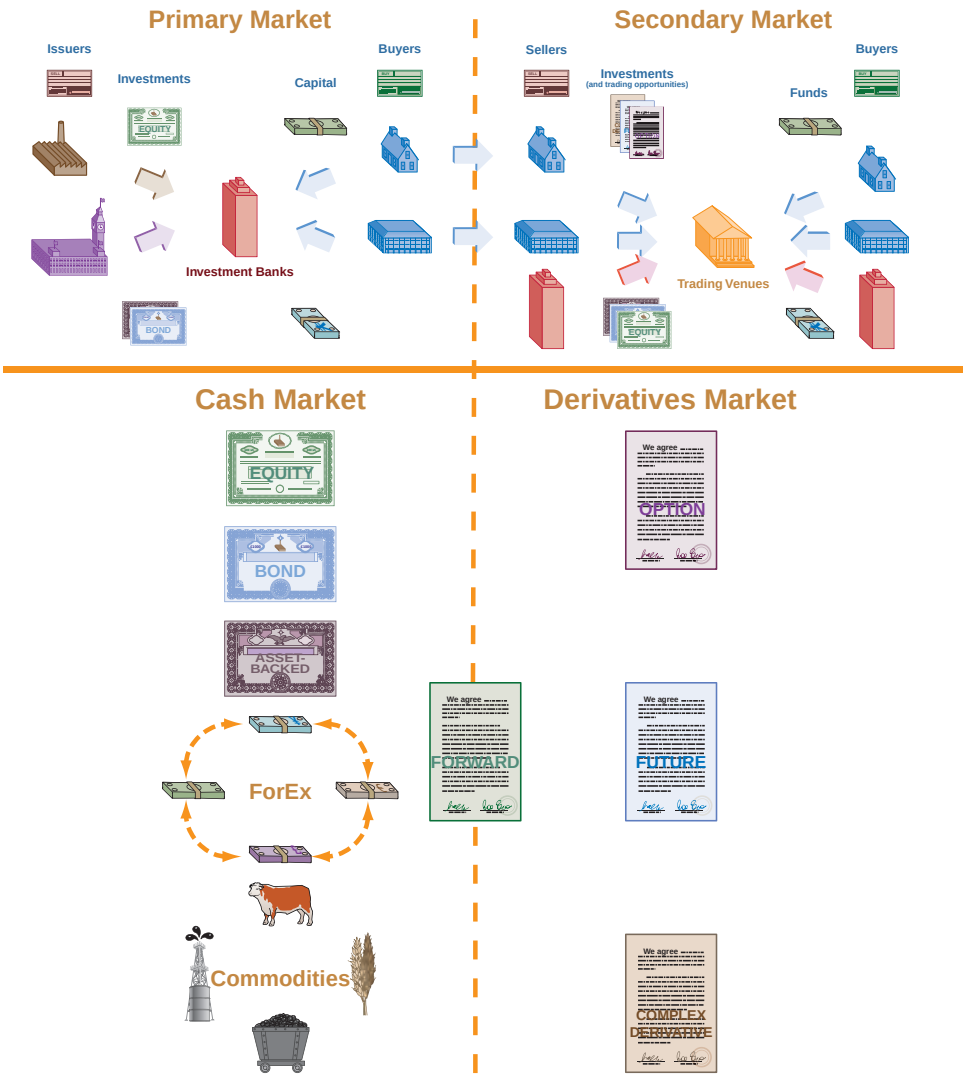

Figure VG.4 Market definitions

contracts, which may result in actions that have the potential to create assets with intrinsic value.

We use the metaphor of the Street to define and categorize entities (see Figure VG.5). The Street runs north/south and is bisected by an east/west street. The left side of the Street is the buy side and the right side is the sell side. Beyond the buy side and the sell side, there are supporting entities. Entities north of the cross street are institutional entities and those south of the cross street are retail entities.

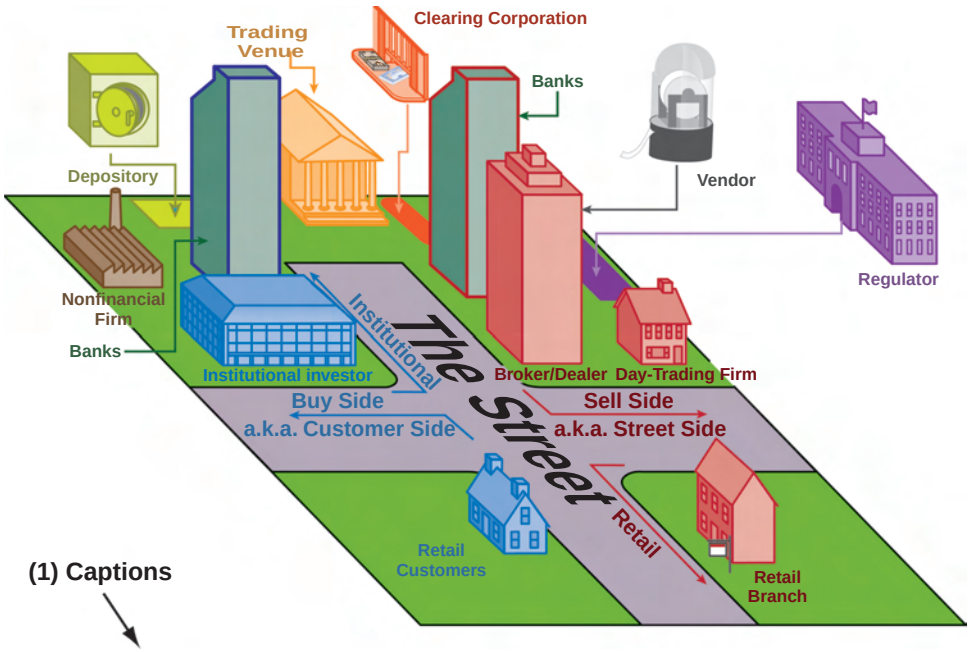

Figure VG.5 Metaphor of the Street

Each figure (except book maps and graphics inside of sidebars) has a caption (1). The purpose of the caption is to distill into a simple declarative sentence the meaning or purpose of the concept illustrated in the figure.

In Figure VG.6 we summarize the function of each entity described in Part 1 of Book 1, *An Introduction to Trading in the Financial Markets: Market Basics,* using labels that point to the "footprint" of entities.

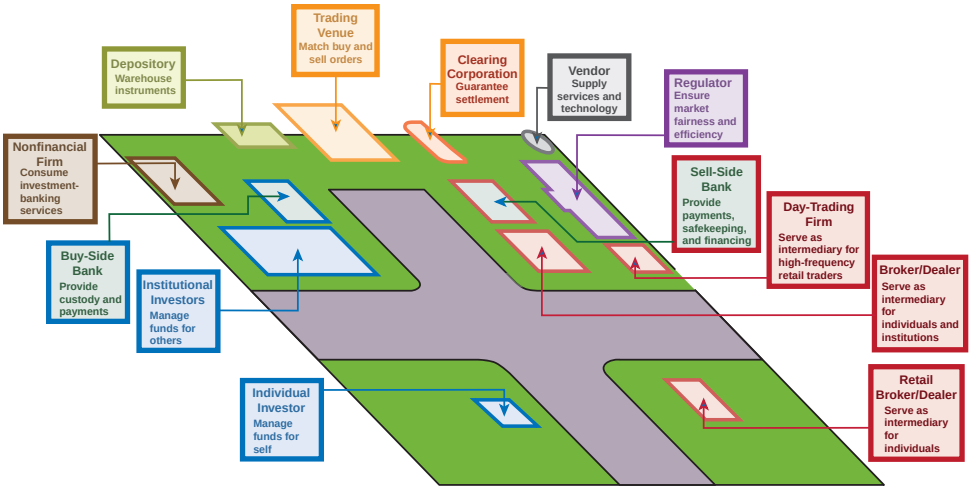

Figure VG.6 Functions of the entities

Throughout the set, steps in a process are presented on circular backgrounds that are color-coded to indicate which entity group is involved. Function icons (described in Part 4 of Book 1) are placed on the background. Each step is numbered sequentially with letters added when events happen in parallel.

PART 1: INVESTING AND TRADING

Part 1 employs graphics to provide an overview of the concepts of different investment and trading styles, as well as the implication of those styles on trading behavior.

At various points throughout the books, we employ a double-point arrow to represent a spectrum. In Figure VG.7 we contrast the use of the markets to profit from investing with profiting from the trading process directly.

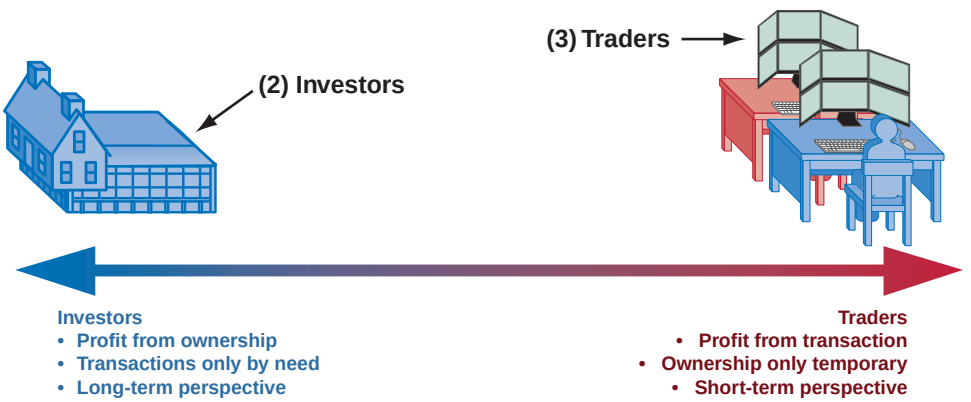

Figure VG.7 Investing versus trading spectrum

We use the image of a retail investor and an institutional investor (entity icons in blue for the buy-side) to represent investors (2) throughout Part 1. We use the images of the function of a proprietary trader (function icon in red) and a buy-side trader (function icon in blue) to represent trading and/or trading in order to profit from a trade (3).

We use the representation of "the thinker" with a "thought bubble" (see Figure VG.8) to represent concepts. The concept representation is illustrated within the bubble.

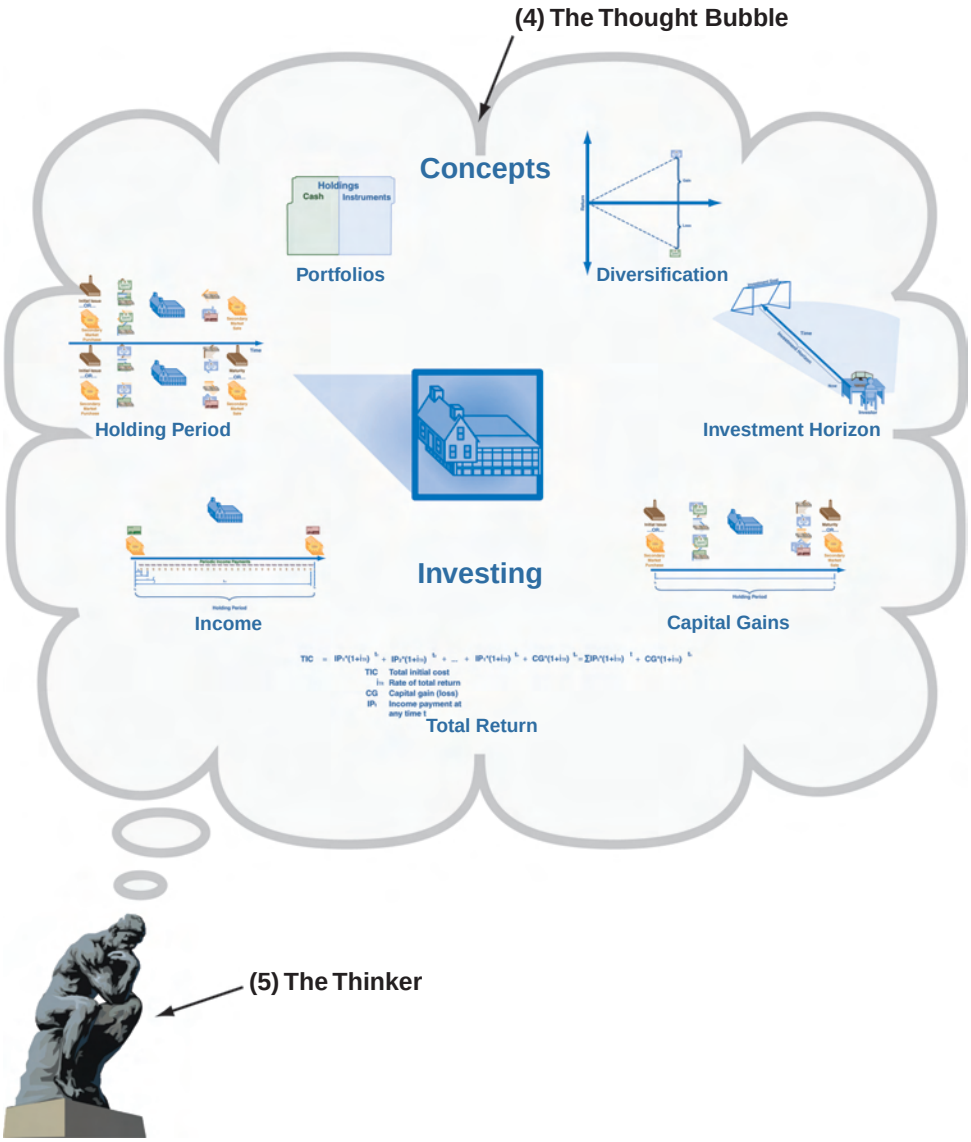

Figure VG.8 Concepts

The thought bubble (4) contains the image illustrating the concept. We use a representational image of the thinker (5) to indicate a concept.

We represent liquidity that is hidden from other participants in a market by showing part of a set of orders hidden behind a curtain (see Figure VG.9).

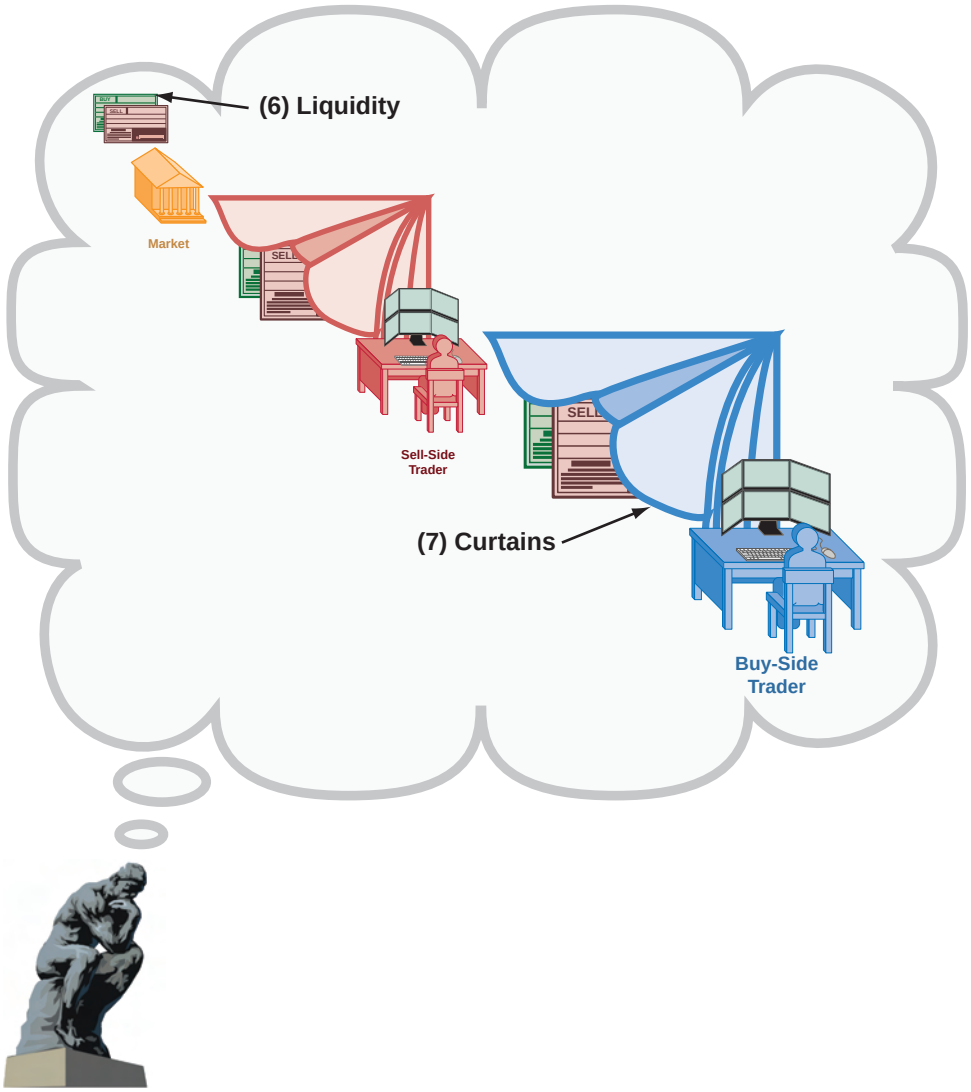

Figure VG.9 Hidden liquidity

In describing the concept of "liquidity," we represent liquidity with buy and sell orders (6). The relative size suggests that buy-side traders have more liquidity and show only a portion to the sell side. In turn, the sell side has more liquidity than is exposed to the markets. We use color-coded curtains (7) to indicate that participants hide a portion of the liquidity the control from others in the market.

We use the image of holdings in a position or portfolio to illustrate the activity involved in various motivations behind an order. Here a portfolio manager has made a decision to sell one asset and to buy another (see Figure VG.10).

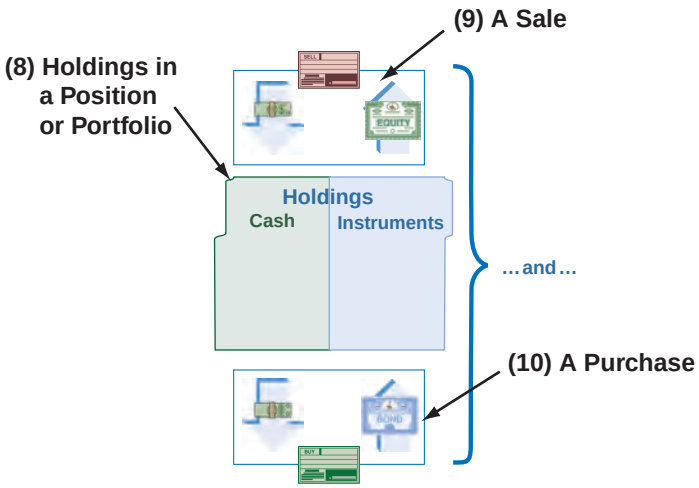

Figure VG.10 An asset exchange

We represent holdings as a file folder (8) that may contain both cash and instruments. Holdings on the buy side use a blue fill for instruments and a red fill denotes the sell side. Cash has a green fill for both. We indicate a sale with a sell-order icon and arrows (9) showing cash flowing into the holdings and instruments flowing out. A purchase is represented with a buy-order icon and arrows (10) showing cash flowing out, and instruments flowing into the holdings.

We use the time and price framework shown in Figure VG.11 to represent quote elements existing for short periods of time with fluctuating prices. The grid shows time to hundredths of a second across the top and prices in decimal increments down the left side (11). For purposes of our study, we limited the time intervals to hundredths of a second but any time periods could be used.

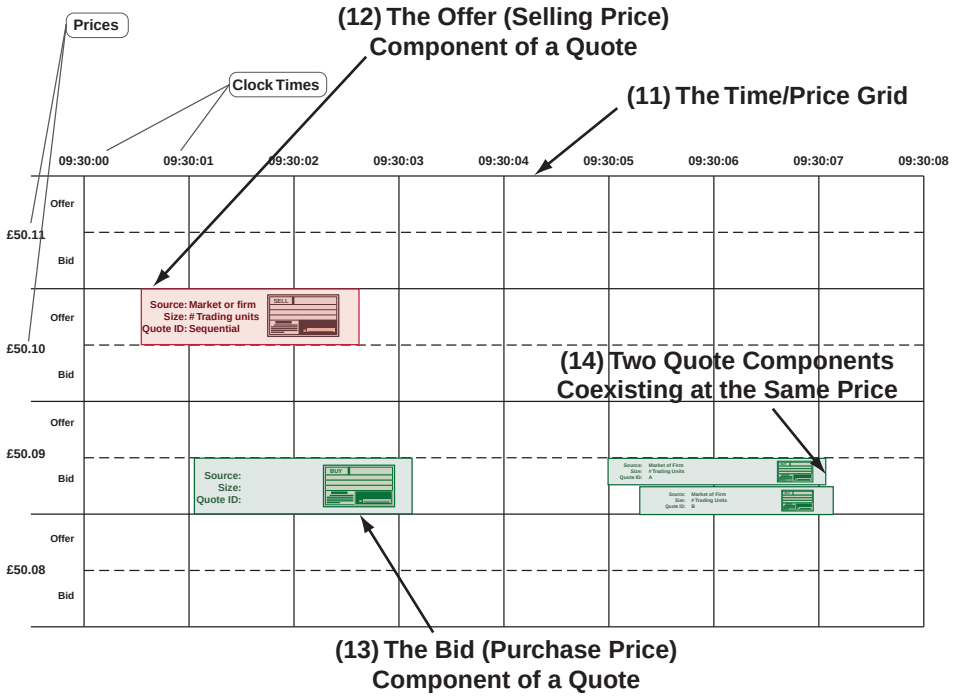

Figure VG.11 Dynamic quoting behavior[1]

1 We are indebted to Mr. Lee Greenhouse (Greenhouse Associates) of Chicago for this method of representation. In 2006 we conducted a study for the U.S. **Securities and Exchange Commission (SEC)**, the **Consolidated Tape Association/Consolidated Quote Operating Committee (CTA/CQOC),** and the **Unlisted Trading Privileges (UTP)** exchanges to develop a functional specification for allocating revenues to be shared among the participating exchanges as required by **Regulation National Market System** (Reg NMS). We needed a means to represent quotes from various sources that existed in a consolidated environment for finite periods of time. Mr. Greenhouse devised this method of representation.

The offer (selling price) component of a quote is represented in red with a sell-order icon (12). It begins when the sell component is first displayed and remains as long as it is the "best" (lowest) sell quote or order to sell. The bottom of the bar is the price. Note that there may be other sell components in the market, but they are at inferior (higher) prices.

A green bar and a buy-order icon represent the bid (purchase price) component of a quote (13). In the case of the buy component, the top of the bar is the price. When two (or more) quotes exist at the same price, the first quote is represented on top with the second below it (14). Our intention is for you to understand that both of the quote components are at the same price (top of the uppermost bar).

We use our spectrum arrow to differentiate orders that are sensitive to price on the left and those that are sensitive to time on the right (see Figure VG.12). The distance between the callout lines are meant to indicate relative relationships and are not meant to suggest absolute or quantifiable differences. We use callout lines emanating from a continous arrow to indicate different elements distributed along the continuum (15).

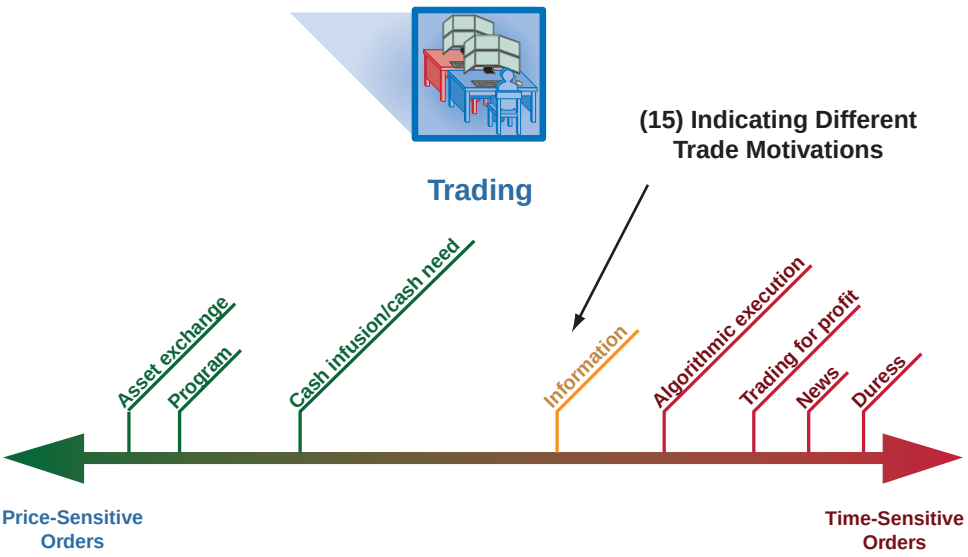

Figure VG.12 Order sensitivity

Figure VG.13 represents the different cost and revenue elements derived from trading. It does not consider long-term benefits from holding an instrument as an investment.

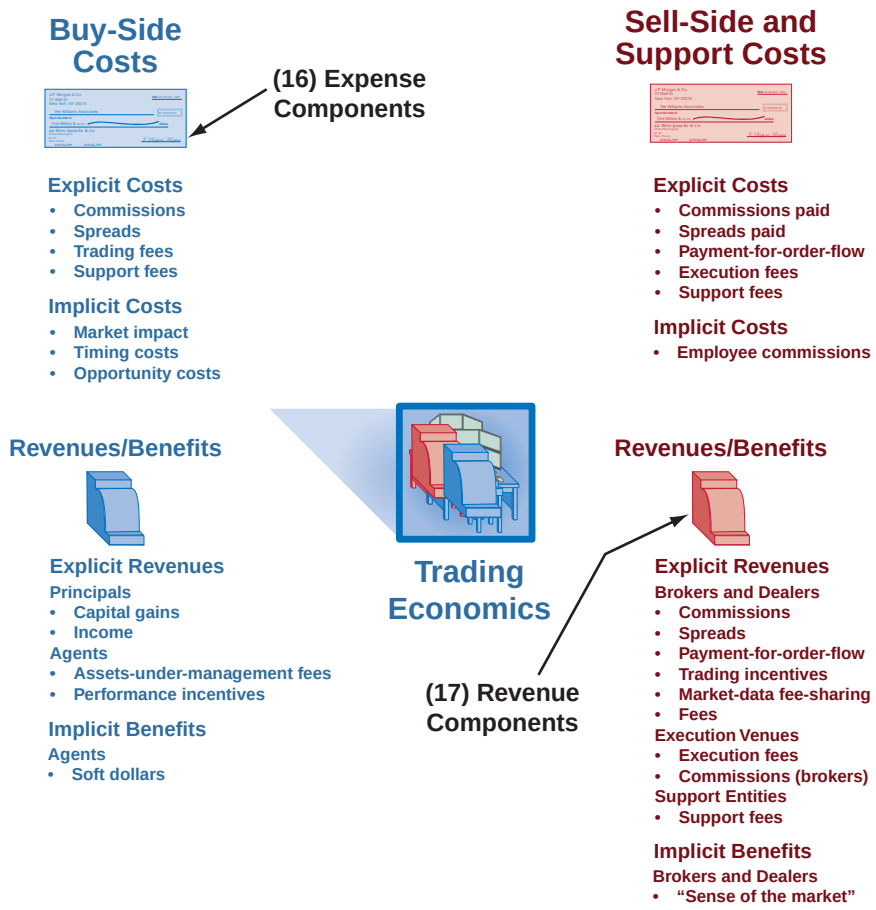

Figure VG.13 Trading economics

We use a color-coded check (cheque) icon (16) to represent payments or expenses incurred by a trader during the execution process. We use a color-coded cash-register icon (17) to represent revenues or income received by a trader during the execution process.

At the end of every part in each book of the set, we present a map that shows information related the content covered within the part that can be found in parts of other books in the set (see Figure VG.14).

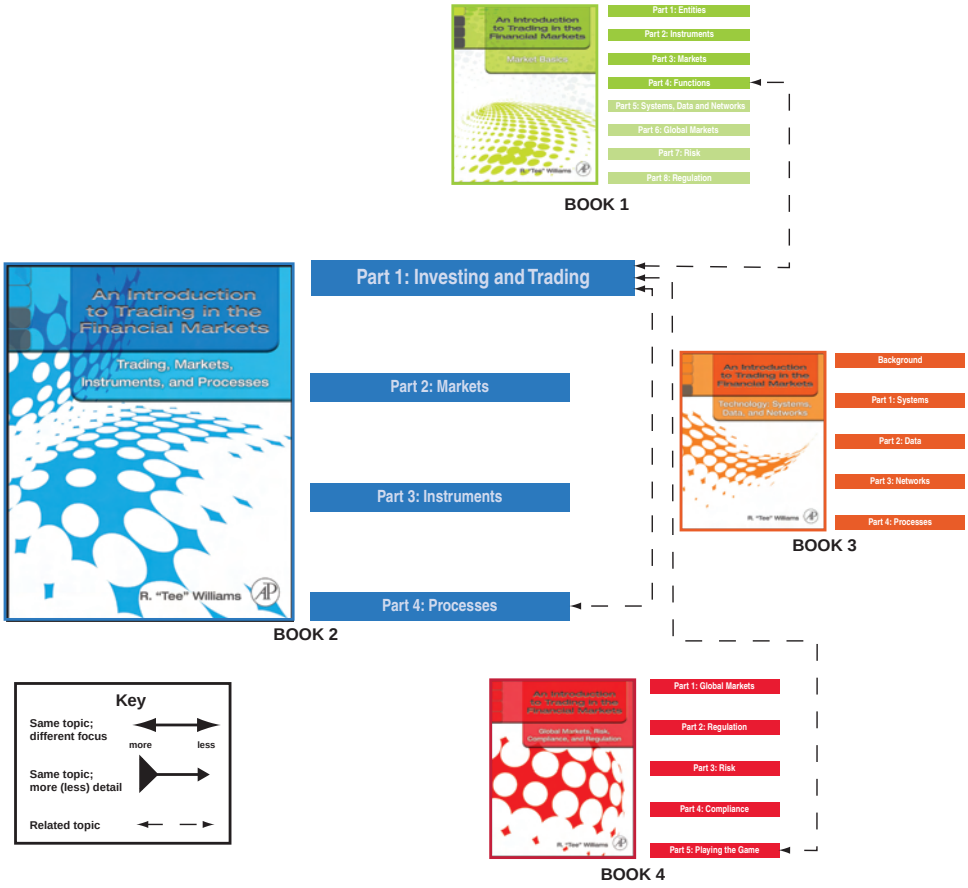

Figure VG.14 The set map

PART 2: MARKETS AND MARKETPLACES

This book's second part is primarily concerned with describing the mechanics of different types of trading venues.

Figure VG.15 illustrates the representation of the overview flow for the primary market (a similar flow exists for the secondary market). Issuers on the left sell issues (represented by instrument icons and arrows) through an underwriting syndicate to investors on the right. Money flows back through the syndicate to the issuers. The issue must go to regulators for approval at the bottom.

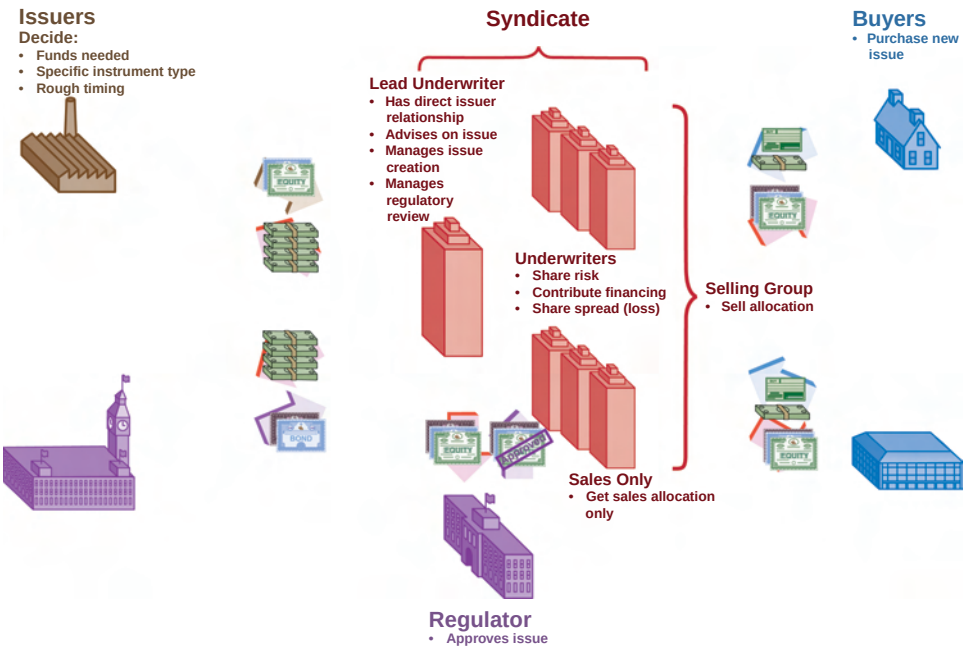

Figure VG.15 The overall market process

The comparative operations of the physical markets and the electronic markets is shown in Figure VG.16. No attempt has been made to describe the actual mechanics operating on either market. Instead, the top is intended to represent the physical actions of agents for the buyer and seller interacting on an exchange floor (i.e., trading pits) or verbally on the phone. In contrast in an electronic market, agents operate using terminals (or direct electronic links) to the computers that operate the trading mechanics.

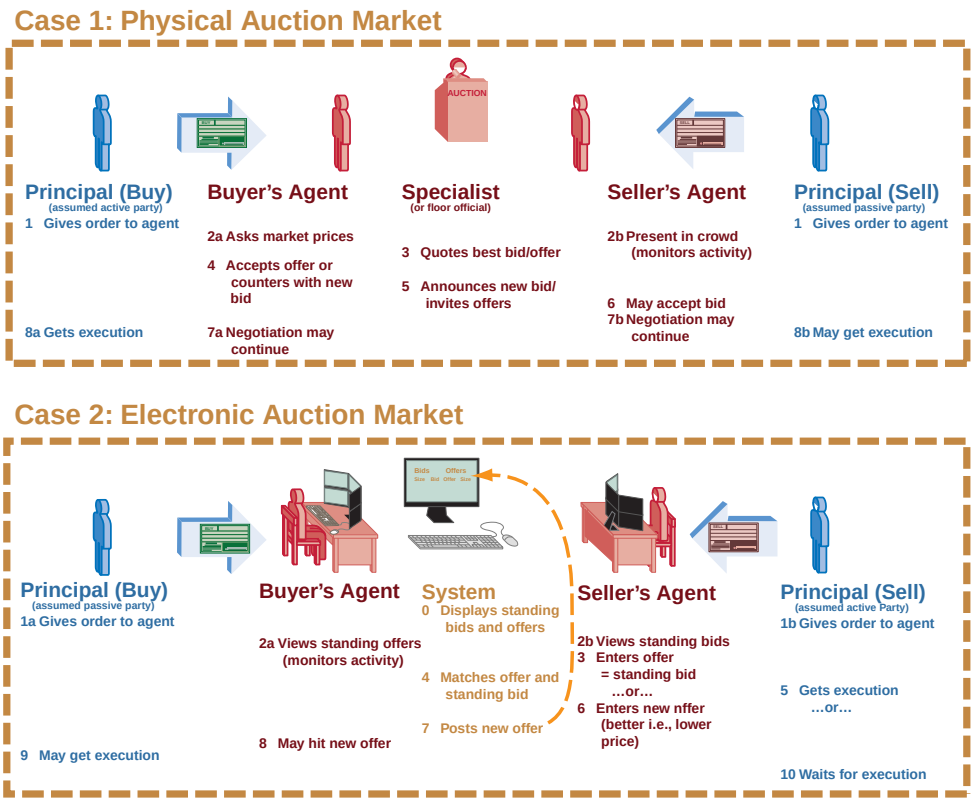

Figure VG.16 Comparing physical and electronic markets

Figure VG.17 is representative of several diagrams that explain the mechanics of different types of execution tools. We describe the steps in the process sequentially from left to right, and we show the execution tool at the top with the participant at the bottom.

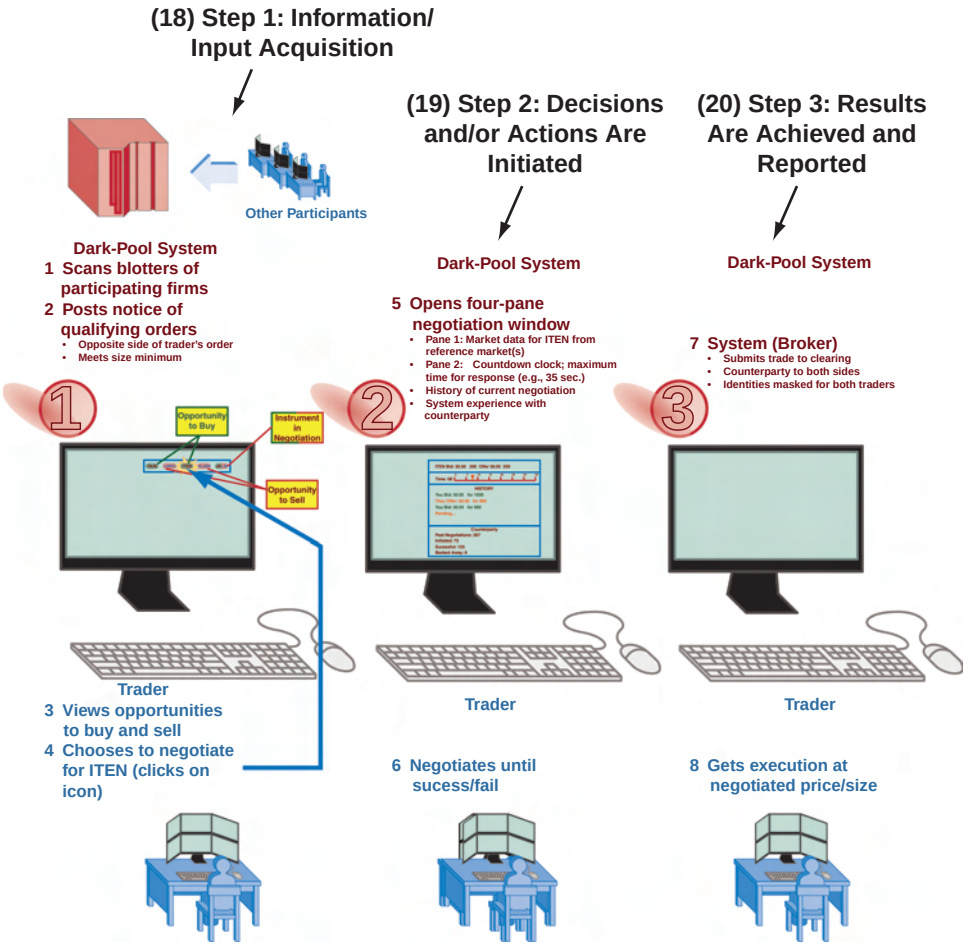

Figure VG.17 A three-step execution-tools diagram

The information provided to the participant is shown on the computer screen in the middle. (Remember that we are representing participants as traders sitting before display screens, but the participant could equally be an algorithm in a quantitative trading system). Frequently we show the process as three steps presented as large numbers inside a circular process icon with a drop shadow.

Data is acquired from some source(s) that precipitates the activities involved in the process (18). For example, new prices are received for an instrument. Based on the input from the data received, some action is taken (19). In many cases this involves interacting with an external entity such as an intermediary, a market, or both. At other times the interaction may be with another function within the same entity. As a consequence of events external or internal to the entity, a result is achieved and is usually reported back to the participant (20).

Figure VG.18 uses an arrow with only one tip to represent a continuum; however, unlike the two-arrow representations, the left of this line represents quotes that are not firm (i.e., indicative). Firmness then increases to the right.

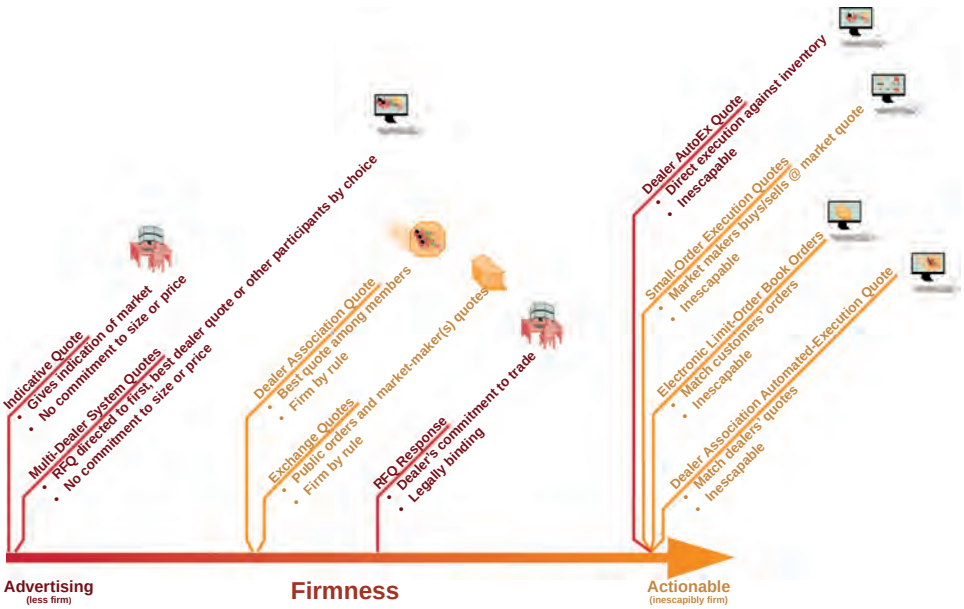

Figure VG.18 Increasing firmness for different types of quote-like prices

PART 3: INSTRUMENTS

The instruments section of this book describes the attributes of different instrument types and the markets in which each instrument category trades (see Figure VG.19). Spread throughout the graphic are market type icons (21) indicating the types of market mechanics that work best for different combinations of natural liquidity for a particular instrument and the relative size of orders in that instrument.

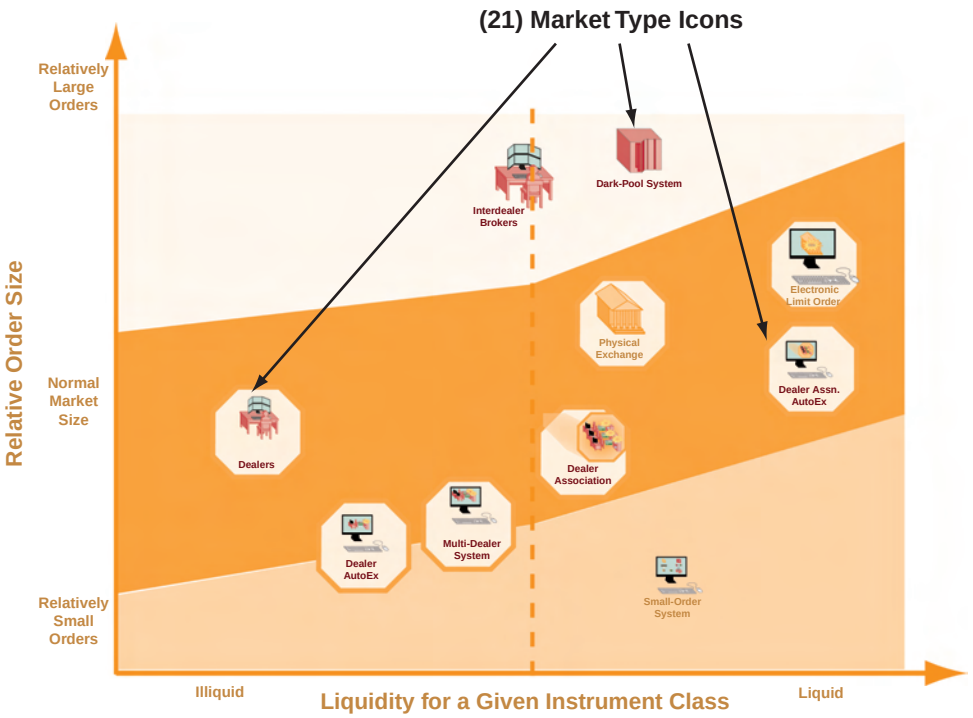

Figure VG.19 The liquidity behavior of instruments

This figure presents a qualitative picture showing that within instrument categories there is a spectrum (left to right) of liquidity for each category. There also is a difference for any specific instrument in the liquidity (top to bottom) for orders based on the relative size of orders compared to a "typical" order size for the instrument.

For each instrument type, there tend to be established linkage structures connecting investors and principals on the left through intermediaries in the center to trading venues on the right as shown in Figure VG.20. Some instruments (e.g., fixed income and ForEX) do not have trading venues in the same way equities and derivatives do.

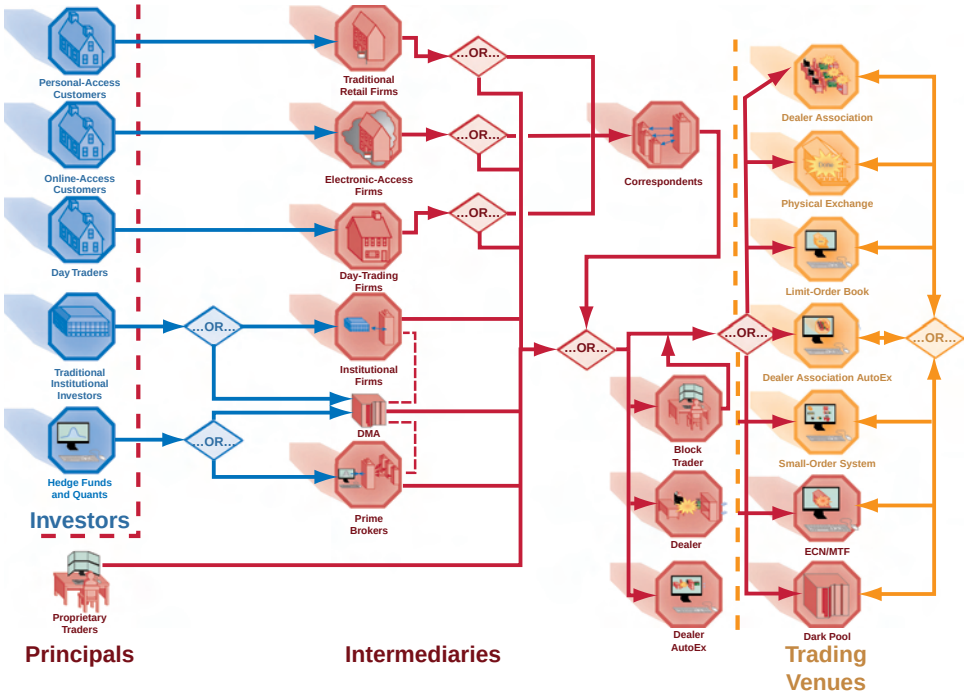

Figure VG.20 Market-linkage structures

PART 4: PROCESSES

In this part, we use graphics to explain the primary and secondary market processes and each step within each process.

For both primary and secondary markets, we begin Part 4 with a more detailed representational flow that shows not only how the steps operate among each of the entities, but also through the front, middle, and backoffices of the buy and sell sides (see Figure VG.21). This is a more detailed representation of the flow that was first presented in the Overview of Book 1.

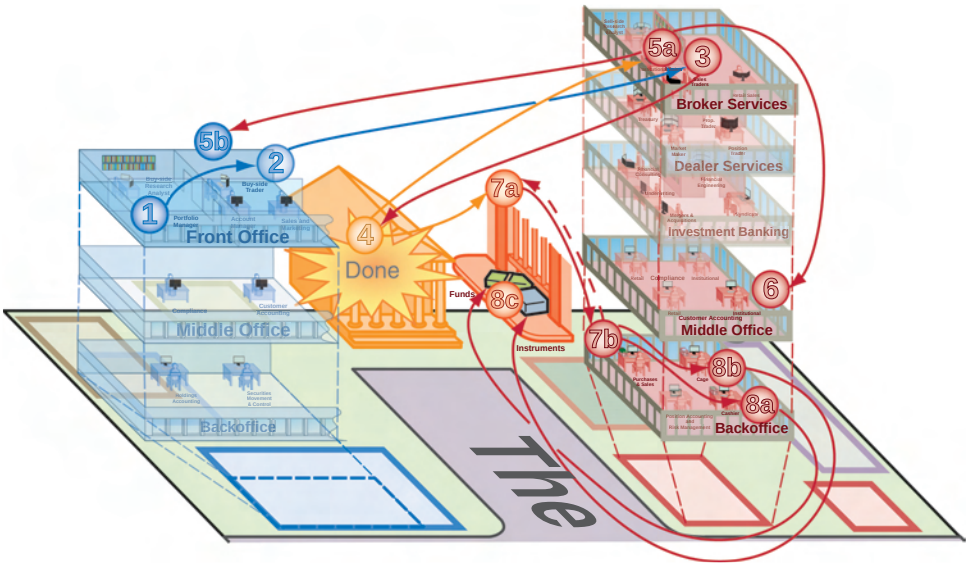

Figure VG.21 A representational trading flow

Figure VG.22 shows one of the steps in the flow for the secondary market. Each step in the primary- and secondary-market processes is illustrated. Many of the functions, which were introduced in Part 4 of Book 1, are involved in the processes and are the subject of individual steps.

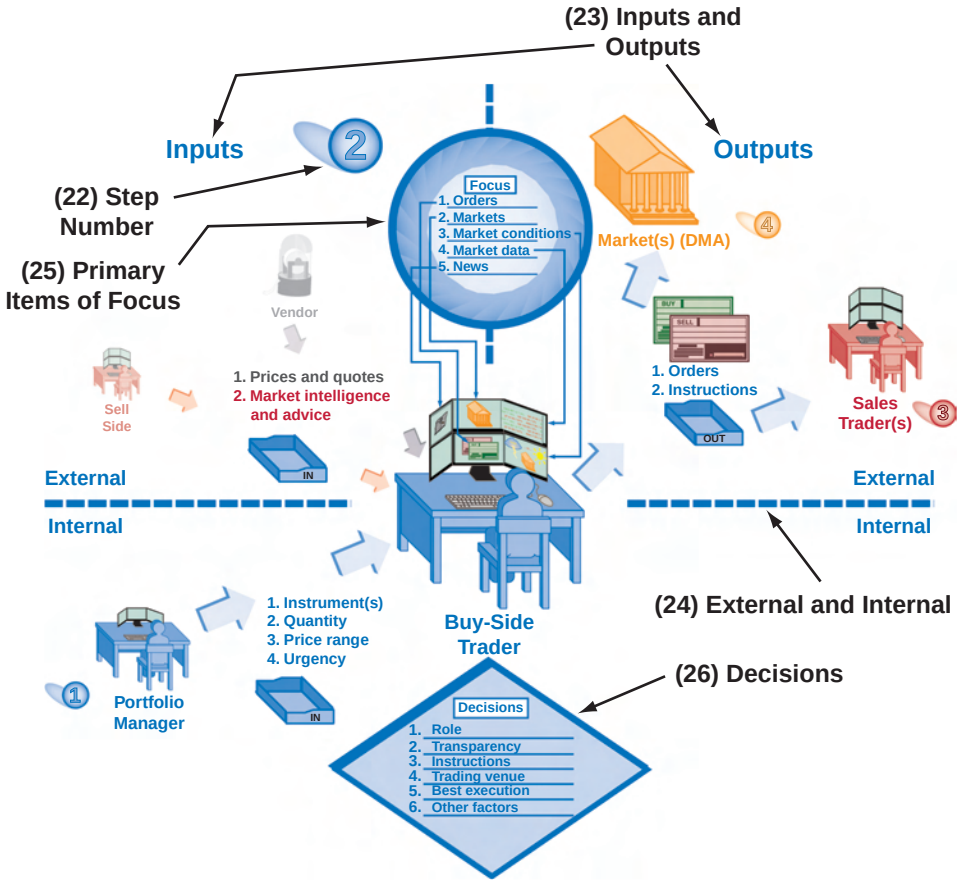

Figure VG.22 Buy-side order management

At the top of each step graphic is a number (22) in a circular background that relates the step being described to the process flow diagrams. The left side of each diagram shows the entities and functions that send information to the process step (23). On each side of the function icon are inboxes (left) and outboxes (right) showing specific items the process step receives and produces.

The diagram is divided vertically by a dashed line (24). External entities that interact with the process step are shown above the line, and functions that interact with the function are shown below the line.

A circular icon representing a camera lens is presented above each function icon and indicates the subjects of primary focus for the process step (25). These in turn are linked to representations of major information available to the function displayed in the panels of the computer screen on the function icon. We will expand on the information available to each process step in Book 3, *An Introduction to Trading in the Financial Markets: Technology—Systems, Data, and Networks*.

Directly below each process step is a decision icon (26). It contains a list of important decisions that are required of the step, and in some cases tasks to be performed.

The execution of an order over the course of the trading day is shown in Figure VG.23. The clock faces show time across the top and subject functions are shown vertically at the left. The purpose of the flow is to illustrate what each function (i.e., the portfolio manager, the buy-side trader, or the sales trader) knows at each point in the trading day, and what happens as the order is executed piece by piece based on available trades that can be achieved in the market.

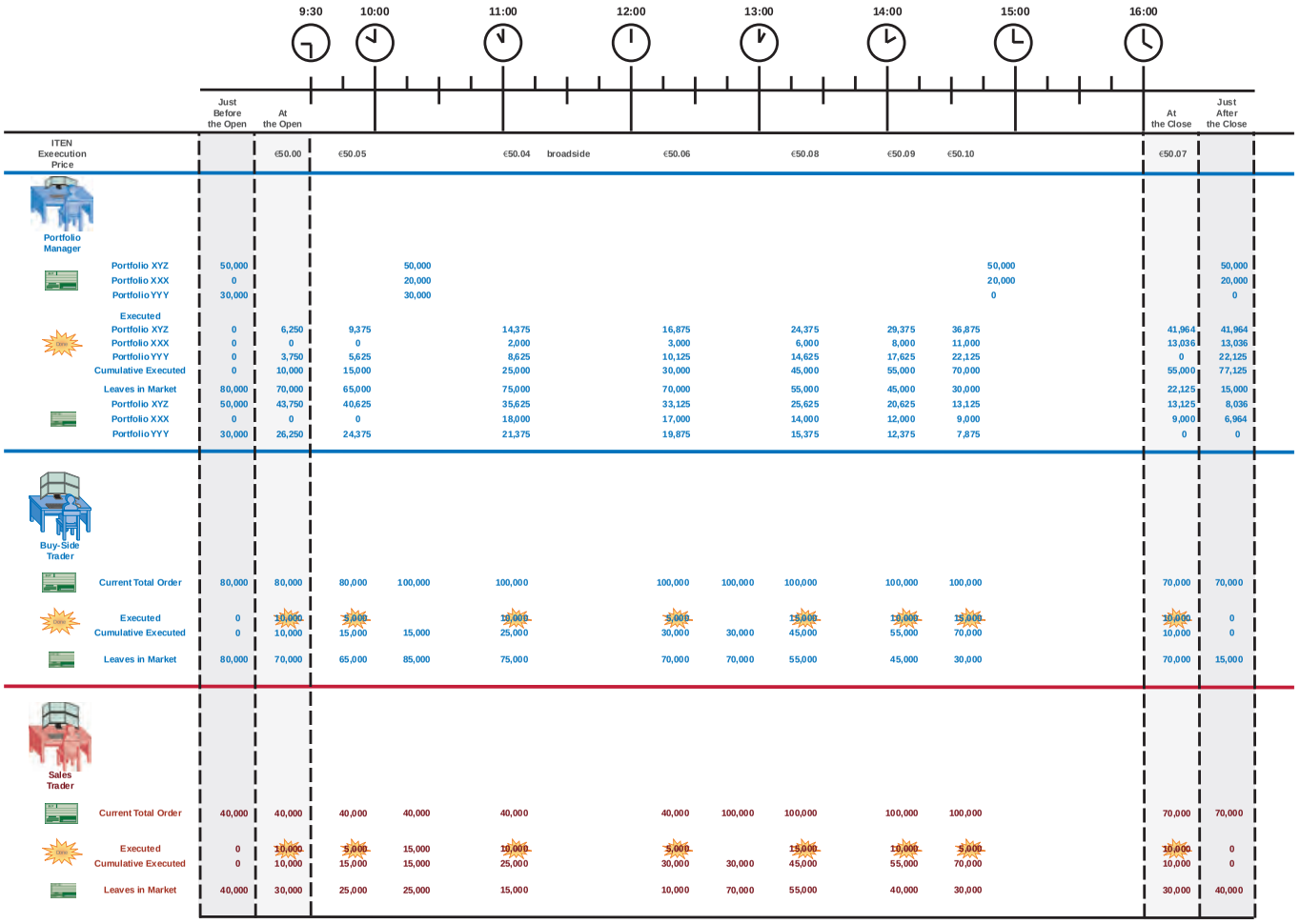

Figure VG.23 A time-based process flow

This chart is used to explain the reason that complex orders must be allocated to compute average prices. The calculation of the average price is described further in Book 3. Moreover, we take this representation throughout the entire market process as we pursue the description we call "Playing the Game" in Part 5 of Book 4, *An Introduction to Trading in the Financial Markets: Global Markets, Risk, Compliance, and Regulation*.

Figure VG.24 shows the passage of ownership from a seller to a buyer by bookkeeping entry. This graphic is intended to show that customers (top level) have accounts at buy-side and sell-side firms. The buy- and sell-side firms are in turn customers of and have accounts at banks. Finally, banks have accounts at and are "customers" of the depository. Each vertical level "knows" the details of its customers and "guarantees" the performance of those customers to the levels below.

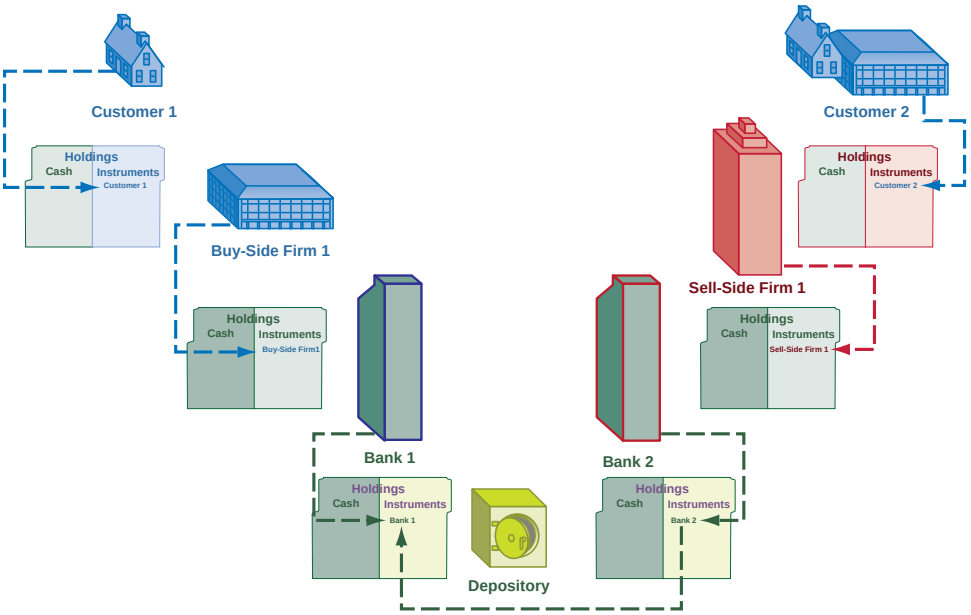

Figure VG.24 The transfer of ownership between seller and buyer by bookkeeping entry

Finally the broker/dealer knows the details of the holdings of accounts for the institutions and individuals it services. (Actually, institutions usually use a bank as a custodian bank to maintaining the institution's holdings. We will examine this in detail in Book 3. We will also see how this same hierarchical relationship structure works for clearing as well.)

The representational process flow, even in three dimensions as we saw in Figure VG.21, had become too complex to be easily understood. Therefore we switch to a business process flow diagram, as shown in Figure VG.25, to represent the primary and secondary market processes. This diagram presents the process steps horizontally. The entities affected by the process are presented vertically at the left.

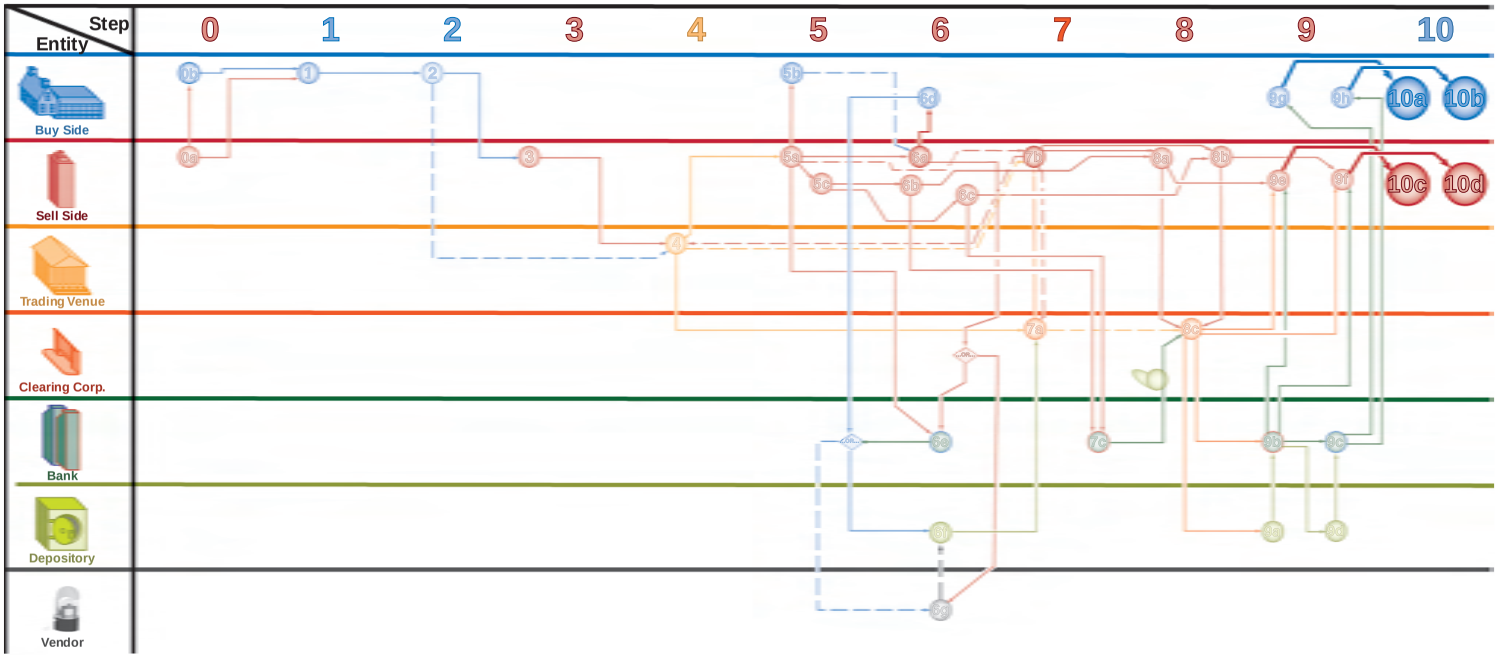

Figure VG.25 Support functions

In Part 4 there is a process flow for both the primary and secondary markets. Initially, in Chapters 1 and 2, we only show the steps directly involved in the two processes (i.e., the primary market and the secondary market). In Chapter 3 we add additional supporting steps to complete both processes. As the additional steps are added, more entities become involved in the process. Also the number of steps grows as preliminary activities are shown, and subsequent activities complete ownership registration and the like.