VOLUME II

SOFTWARE AND DATA

PART IV

DATA OPERATIONS IN FINANCIAL INSTITUTIONS

EDITORS' INTRODUCTION TO PART IV

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The first volume of the Handbook described the need and context for data infrastructure changes in financial institutions (FIs) arising from regulatory pressures and increasing sophistication in risk management. The volume also described the major types of data found in FIs. This volume turns to the issue of how to implement an infrastructure to satisfy the risk management needs raised previously. One obvious aspect of implementation – technology – is addressed in Part V. Part VI follows by describing processes to assist in effectively implementing and running an environment to manage an analytics on financial data.

Most (but not all) data in an FI are created at the point of transaction. These data are then used in different parts of the organization. In addition, there are processes to derive data from underlying transactional data – this is common in risk measurement activities for example. Much of the challenge of implementation arises with how data are created or modified in an FI. If data are created with a high degree of fidelity at the point of origination, then the challenge of data integration and usage is much simplified. Unfortunately, however, many major FIs generate transactional data of sometimes questionable quality. In addition, operations in these FIs involve creating aggregate reports by drawing from source systems in ways that are often not consistent, resulting in concerns about the fidelity of the resulting reports and analytics generated from this information. For these reasons, an important ingredient in addressing the data quality problem lies in a good understanding of the business processes responsible for generating and modifying data.

Part IV aims to give the reader an understanding of the business processes in the financial industry. Business processes within the financial industry can be complex given the many different subindustries involved. In addition, the plethora of financial products available results in rather different considerations for processing. The section accordingly begins with Chapter 15, by John Carroll and Jonathan Sparks, describing the various players in the financial industry such as firms active in the capital markets and retail banking. Additionally, ancillary institutions are

described, including service providers like exchanges and custodians, as well as the gamut of regulatory organizations that oversee the financial industry in the USA. Chapter 16, by Janine Forsythe, describes generic processes in the financial industry and how these generate or use data. This is done by creating a process model of a generic FI and mapping the components of this model to specific types of businesses within the financial industry. Chapter 17, by Dianne Buonincontri and Nicholas Robson, focuses on the data requirements of these business processes and presents a framework for understanding how this data is managed within a financial organization. Detailed treatment of how five important kinds of financial data are produced is accompanied by a discussion of common problems and solutions seen in FIs.

Since capital markets products are a distinct and complex topic, Chapters 16 and 17 focus on these products alone. To bring a retail financial products perspective, Chapter 18, by John Hunt, Richard Stanton and Nancy Wallace, rounds out the section with a detailed discussion on data in the mortgage industry. The chapter describes whole-loan mortgage data, and shows how mortgages transfer through the supply-chain to help yield new products that generate their own data.

In summary, this section provides the foundation for improvement in generating risk information from financial data by describing the processes that are used to generate and modify that data. In combination with the following sections on technology and implementation procedures, this volume should give the interested reader a solid foundation of the disciplines required to address many important challenges in managing financial data.

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Financial market participants

John Carroll and Jonathan Sparks

15.1 Interactions of institutions in the financial industry

There are many unique financial institutions in the USA, with each fulfilling a specific role in financial transactions. Information providers, financial intermediaries, buy-side and sell-side firms, commercial banks, Government Sponsored Entities (GSEs), and regulators, all interact with one another to form the complex web that is the financial industry today (see Figure 15.1). Broker-dealers, Investment Banks, Commercial Banks and Asset Managers transact their own and their clients' business in the financial services markets.[1] Custodians, Agents, Exchanges and Depositories[2] perform diverse functions throughout the financial industry.

Maintaining a fluid transactional system requires institutions to communicate with one another using the same or similar data types. Both investors and regulators need to understand the data provided to them in transactions. The best way to accomplish this is through the use of industry-wide standards for data capture and reporting. Unfortunately, this does not exist in most cases; data collection methods are diverse, and processing the sheer amount of data available is difficult – if not impossible – for most individual investors. For example, classes of derivatives are often mislabeled as other instrument types. This throws off the data stream, and makes for bad data collection.

Data need to be collected and processed in a timely manner so as to be available and "fit for purpose" for participants in the financial marketplace. To the extent that

[1] Agency trades occur when a firm buys or sells a security on behalf of one of its clients. In this situation, the firm does not own the actual security itself, but rather, is working as an agent for its client. Normally, the firm charges its client a fee for this service. Conversely, a principal trade occurs when the firm buys or sells its own securities for its own profit. For more information, see Johnsen (2011).

[2] Each of these functions is further defined in Chapter 16.

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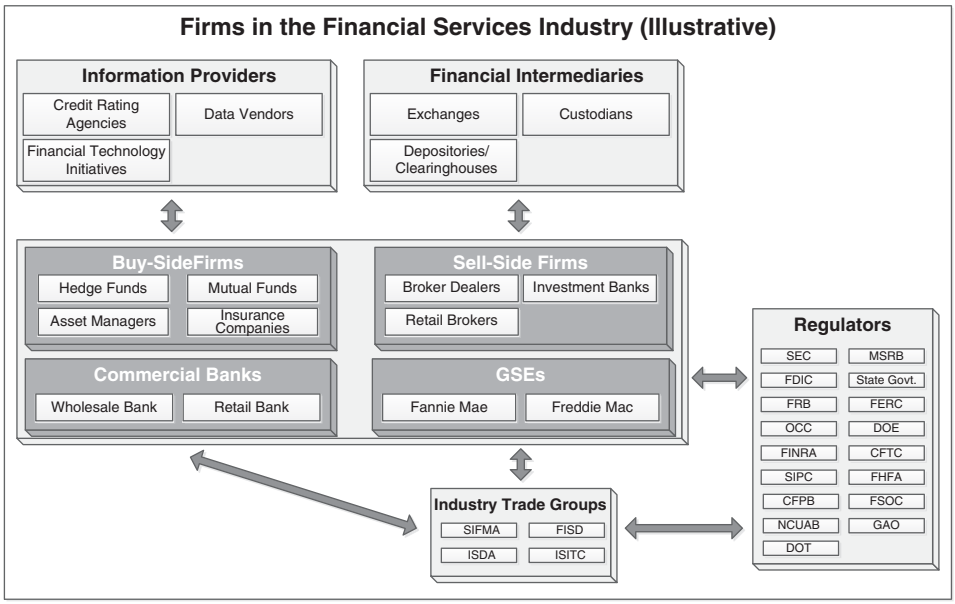

Figure 15.1 Interactions between firms in the financial industry.

participants do not or cannot create or update the data themselves,[3] the data must be acquired from Data Vendors who all have their own unique system of data collection and reporting. While several industry participants have attempted to create comprehensive data stores over the years, a lot of work remains to achieve the goal of establishing an enterprise-wide standardized data repository for all data domains that is fully integrated in the financial industry's data process systems. The work required for an institution to use this data within its organization across businesses, product lines, and global regions is extensive, complex and expensive. Those that have had a degree of success in establishing the data stores have found integrating the data, if only internally, to be a nearly impossible task. Further, once success is achieved internally it must be continually maintained and enhanced as businesses and regulatory laws change. Even then, although a single organization would benefit from such capability, it would not solve all the financial industry's data problems. Using one single standardized data collection method and collection entity can better inform the investing public and reduce redundant information costs associated with data research.

This chapter will describe the various financial market participants and their unique roles and relationships to one another. Additionally, the logistics and data needed to support financial transactions will be discussed.

[3] Updating and processing data includes evaluating instrument values, entities and their hierarchies, applying prices, defining corporate actions terms and conditions, providing positions and transactional information, and determining finance and risk measurements.

15.2 Sell-side financial institutions

There is an important distinction between "sell-side" and "buy-side" institutions. Sell-side refers to all financial institutions or individuals that make their money from transaction fees and commissions they charge their clients for trading securities. For example, if a portfolio manager for a mutual fund purchases 1,000 shares through a broker-dealer, the broker-dealer makes a commission on the purchase. In this example, the broker-dealer is considered "sell-side" because he makes his money from fees on the transactions themselves. Conversely, the portfolio manager is considered "buy-side" because his money comes from buying stocks.

15.2.1 Broker-dealers

Broker-dealer is the term for any individual or firm that buys and sells securities for the firm or others. Broker-dealers are on the "sell-side" of the industry. While working as a broker, broker-dealers execute orders on their client's behalf; clients can be individuals or entities. When acting as dealers, broker-dealers engage in trades for clients or their firm's own account. Securities purchased for the firm's own account may be sold to clients or other firms or kept as property for the firm itself. Although many broker-dealers are independent firms offering only broker-dealer services (some well-known examples include Raymond James and Ameriprise), others are business units or subsidiaries of investment banks, commercial banks, or investment companies. These firms generate their revenue from (1) fees and commissions that clients pay for security and commodity transactions undertaken on their behalf, and (2) interest charged on debit balances in margin accounts.[4]

During the recent financial crisis, a few larger broker-dealers applied for and received a bank charter which allowed them to borrow at the Federal Reserve Discount Window[5] when funds were not readily available to them elsewhere.

15.2.2 Retail brokers

Retail brokers primarily serve smaller "retail" investors rather than large companies or "institutional" investors. A good example of a retail broker is ETrade,

[4] Margin accounts are accounts where a broker-dealer temporarily lends to a client so that the client can purchase securities, usually on a securities exchange.

[5] The Federal Reserve Discount Window refers to the ability of certain banking institutions to borrow, usually short term, loans from the Federal Reserve at discounted rates in response to liquidity problems. The discount rate offered is controlled by the Federal Reserve. See Federal Reserve Discount Window website, available at `www.frbdiscountwindow.org/discountwindowbook.cfm?hdrID=14&dtlID=43` (last visited March 23, 2012); see also Tanselle (2011).

which allows customers to trade and sell their own stocks on major stock exchanges, without necessarily having large amounts of capital to invest with. Other popular retail brokerage companies include Charles Schwab and Merill Lynch.

15.3 Buy-side financial institutions

15.3.1 Asset and investment management

Asset and investment management refers to the professional management of various assets[6] and securities, such as shares and bonds. The goal of asset and investment management is to help investors meet their specific investment goals. These investors may be institutions (pension funds, insurance companies, corporations, educational establishments, charities, etc.), private investors who work directly through investment contracts, or more commonly, investors that use collective investment schemes like mutual funds.[7]

Defining some terms associated with asset and investment management may be helpful. "Asset management" refers to the management of collective investments for private investors – this is considered "buy-side," referred to in Section 15.2. More generically, the term "fund management" refers to any form of institutional investments, including asset management. Investment managers that specialize in either discretionary or advisory management for private investors usually call their services "wealth management," or "portfolio management."[8] All of these terms are included under the umbrella term "private banking."

"Investment management services" specifically refers to financial statement analysis, the selection of assets and stocks to purchase, and constantly monitoring investments. The large global investment management industry supervises trillions of dollars, yuan, euro, pounds, and yen. Many of the world's biggest companies are, at least partly, investment managers.[9] Aggregated, these companies employ millions of employees that create billions of dollars in revenue. "Fund managers," also

[6] The term "asset" can refer to many different things, and is often incorrectly used in reference to liabilities. The basic definition of an asset is property or an interest in something that produces money at a profit, rather than a loss. The term generally refers to real estate, but can also refer to an owned business or collector's item that is gaining value. While the technical definition of an asset requires that the property appreciate in value, at a profit, the term is also used to refer to property that is a liability. For example, in 2007, many people purchased their own homes, which was at that time an "asset" because it appreciated in value. The real estate then depreciated in value, costing the purchaser money, and therefore becoming liability, but is still referred to as an "asset." `www.investopedia.com/terms/a/asset.asp#axzz1qvmqoZUG`; see also *Black's Law Dictionary*, "asset" ("An item that is owned and has value").

[7] `http://dictionary.sensagent.com/asset+management/en-en/` (last visited July 5, 2012).

[8] `http://english.turkcebilgi.com/Asset+Management` (last visited July 5, 2012).

[9] Examples include Blackrock Inc., and State Street Global Advisors, with $3.35 trillion and $1.9 trillion respectively.

referred to as "investment advisers," indicate both firms that provide investment management services and individuals that control fund management decisions such as portfolio managers for mutual funds or trustees for pension funds.[10]

15.3.2 Agents

An agent is commissioned by a corporation or mutual fund to maintain shareholder records. This includes maintaining the client's purchases, sales, and account balances, and managing changes resulting from corporate action events – dividend payments to stockholders, or principal and interest payments to bondholders – on behalf of the stock or bond issuer. Often, the agent is the bank itself, although separate institutions are sometimes created for this specific purpose.

15.4 Commercial banks

Commercial banks are large entities that include smaller subcompanies or banks. Large banks like Wells Fargo or JP Morgan Chase have wholesale bank, investment bank, and retail bank divisions, all of which are included under the commercial bank's company name. This section will speak to the three different types of banks that are normally included under the umbrella term "commercial bank."

Previously, commercial banks were not allowed to do both retail and investment banking at the same time. From the 1933 Glass–Steagall Act until the passage of the Gramm–Leach–Bliley Act in 1999, the USA maintained a distinct separation between investment and retail banking, such that each type of bank had a unique function; overlap was not allowed. This created a unique system in the USA; other industrialized countries, including the remaining G8 countries, did not have this separation.

The theory behind the separation was to avoid public disclosure of sensitive information. Larger banks were usually split into public and private functions via a "Chinese wall." This "wall" separated the private from the public functions, preventing information from crossing over or being shared. Investment banks utilized private inside information that could not be publicly disclosed to retail banking customers. Conversely, the retail banks, including the offices of the stock analysts, only dealt with public information. The Glass–Steagall Act mandated such a separation, but the mandate was overturned in 1999 with the Gramm–Leach–Bliley Act.[11]

[10] `http://en.wikipedia.org/wiki/Investment_management` (last visited July 5, 2012).
[11] For more information, see Congressional Research Service (2010).

15.4.1 Retail banks

Retail banks accept deposits, make business loans, and offer related services to the general public. They provide various types of accounts, including checking, saving, and term deposits.[12] While retail banks do offer some investment services to individuals, they are primarily concerned with receiving deposits and lending to small businesses rather than making large investments in the securities markets. Retail banks are often engaged in the following activities.

1. Processing payments, transfers, and deposits through telegraphic transfers,[13] EFTPOS,[14] internet banking,[15] or other systems.
2. Issuing regular bank checks and bank drafts, such as cashier's checks, that are guaranteed by the bank.
3. Accepting money deposits or term deposits.
4. Lending money by overdraft, instalment loans, or other means.
5. Keeping documents and other items secure in safe deposit boxes.
6. Offering a variety of financial services – operating as "financial supermarkets."[16]

15.4.2 Wholesale banks

Wholesale banks work almost exclusively with large financial institutions and companies, as well as other banks, investment firms, securities dealers, pension funds,[17] and lenders. These banks help corporations, individuals, and governments to raise capital by underwriting[18] and acting as their client's agents when issuing

[12] Term deposits are, essentially, very short-term loans, made by the consumer to the bank itself. These usually last 1–12 months, at which time the lender agrees not to withdraw the money until the specified term matures, www.investopedia.com/terms/t/termdeposit.asp#axzz1pwceGy4w (last visited July 5, 2012).

[13] Telegraphic transfer or "telex transfer," sometimes abbreviated as TT or T/T, transfers money oversees by sending an electronic cable message from one bank to another, http://en.wikipedia.org/wiki/Telegraphic_transfer (last visited July 5, 2012).

[14] EFTPOS stands for Electronic Funds Transfer at Point Of Sale. It specifically refers to debit card transactions made during the sale itself. For example, paying for a coffee with a debit card from your local commercial bank is considered an EFTPOS, http://en.wikipedia.org/wiki/EFTPOS, (last visited July 5, 2012).

[15] Internet banking refers to making transfers or engaging in financial transactions online, through the use of secure websites that are run and monitored by commercial banks. If, for example, you have a checking and credit card account at a commercial bank, and want to make a payment to the credit card online, this transfer can be done remotely via online banking.

[16] Financial supermarkets are institutions or companies that offer a wider range of financial services than the normal commercial bank. Typically, financial supermarkets provide banking, stock brokerage, insurance, and even real estate brokerage. The basic rationale behind the financial supermarket concept is to generate more fees per client and create more business by fostering customer loyalty, www.investopedia.com/terms/f/financialsupermarket.asp#axzz1pwceGy4w (last visited July 5, 2012).

[17] http://en.wikipedia.org/wiki/Wholesale_banking (last visited July 5, 2012).

[18] Most underwriting deals use a "firm offer." In a firm offer, the underwriting investment bank will buy a certain amount of shares from a company making a public offering – selling its stocks in public stock exchanges like the New York Stock Exchange. With firm offers, the investment bank doing the underwriting will purchase shares from the company at a discount, usually 8% below the expected market price. In this way, when the public offering starts, the offering company has already sold most or all of its shares to the underwriter, leaving the