PART One

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CHAPTER 1

Introduction to Operations

1.1 INTRODUCTION

For every action there is a reaction. For every transaction, there has to be an appropriate sequence of processes such as a payment, a delivery of an asset, an exchange of information or a combination of these. We refer to this as an *operational process*. In this introductory chapter, we will see how an investment company's Operations Department relates to other departments within the company and other external organisations.

Firstly, we need to distinguish the operations of an organisational entity and the entity's post-transactional operations.

What do the following types of business actually do?

- Vineyard?
- Publisher?
- Hotel?
- Insurance company?

In simple terms, these businesses produce something (often referred to as *outputs*):

- Vineyards produce wine;
- Publishers produce books, newspapers and computer software;
- Hotels produce satisfied customers;
- Insurance companies help customers reduce their financial risks.

These outputs are the results of the transformation of a variety of *inputs*, including some of the following (the list is not exhaustive):

- Vineyard – grapes, yeast, water, sugar, etc.
- Publisher – authors, ideas, paper, digital resources, etc.
- Hotel – premises (rooms, dining areas), food, staff (front of house, catering, cleaning), ambiance, etc.
- Insurance company – products, sales staff, research & development staff, distribution channels, etc.

This is what businesses "do"; we know this as the business operations and the transformation of inputs into outputs are how each business operates.

Q&A

Question

An investment company is also a business operation. What do you think are the inputs and outputs? How might an investment company be profitable?

Answers

Table 1.1 gives the answers.

TABLE 1.1 Inputs and outputs of an investment company

Inputs	■ Managing portfolios for clients (asset management) ■ Trading for the company's own account (proprietary trading in securities, cash, foreign exchange, derivatives) ■ Advising issuer clients re capital raising (equity or debt) ■ Advising corporate clients re mergers and acquisitions either as target or bidder (takeovers) ■ Designing new products (innovation) ■ Employing strategies to protect assets (hedging)
Outputs	■ Increased profitability ■ Increased wealth for clients ■ Portfolios protected from market risk ■ Successful new issuance of securities on behalf of issuer clients ■ Innovative solutions to investment challenges and changes in regulation
Sources of Revenue	■ Interest from loans to counterparties and clients ■ Trading profits (bid/offer spread) ■ Charging fees to clients ■ Income from deposits, dividends (equities) and coupons (bonds) ■ Commissions levied on new issues, etc.

What is missing here is the processing that occurs after the inputs have taken place. A trader executes a transaction; the decision-making that led to the requirement to transact, the negotiation with a counterparty and the final execution of the transaction are all part of the business operation. What happens next is the completion of that deal. By completion, we mean the settlement, the exchange of the financial instrument for cash. This processing, this completion, is what financial market operations is all about. It is what we in the Operations Department do.

There is, therefore, a distinction between the operations of a business and Operations in the sense of processing most of the inputs. In this opening chapter you will learn:

- How an investment company is typically structured;
- What the departments' roles are;
- What relationships Operations have with internal departments and external entities;
- Other service functions within the business.

1.2 ORGANISATIONAL STRUCTURE OF AN INVESTMENT COMPANY

There is no right or wrong way to organise the structure of an investment company. It depends on the size of the company, the products in which it deals and the locations of its offices.

The biggest companies, for example the investment banks, will have several thousand staff located in offices based around the world. By contrast, the smallest, such as a hedge fund, might have less than 100 staff working from one office.

What is usually certain is that there will be one department that generates business for the company and one that ensures that the business is administered in an efficient, controlled, timely and risk-free manner. In many companies there will be a third department that supports these two.

We refer to these three departments or offices as follows:

- Front Office – the business generator;
- Middle Office – the administrator;
- Back Office[1] – the supporter.

1.2.1 Front Office

The Front Office generates revenue and is responsible for the buying and selling of financial products.

Within the Front Office (see Figure 1.1) there are generally five areas:

1. **Corporate Finance** – This area helps clients to raise funds in the capital markets and advises clients on mergers and acquisitions. Corporate finance can be divided into industry coverage (e.g. financial institutions, industrials, healthcare, etc.) and product coverage (e.g. leveraged finance, equity, public finance, etc.).
2. **Sales** – The sales desk will suggest trading ideas to clients (institutional and high-net-worth individuals) and take orders. Orders must be executed at the best possible price and this can mean placing an order internally or with an external trading desk.
3. **Trading** – The trading desk (aka the dealing desk) executes trades on behalf of the investment organisation (known as principal, proprietary or own-account trading). The traders can take both long and short positions in financial instruments that they have been

[1]Although there is a logical progression from Front to Middle to Back, the term Back Office has been effectively replaced by the term *Operations* in today's lexicon.

authorised to trade in. This desk also executes trades on behalf of the sales desk, as noted above.

4. **Repo Desk** – The repo desk supports the traders by helping to finance their positions. When the traders go long, they need to borrow cash. The repo traders borrow cash through repo. Conversely, when the traders go short, they need to borrow securities. The repo traders borrow securities through reverse repo.
5. **Research** – Research is undertaken for a variety of reasons. For example, equity research review companies write reports about their prospects and make “buy”, “sell” or “hold” recommendations. Predominantly, research is a key service in terms of advice and strategy; it covers credit research and fixed-income research amongst others.

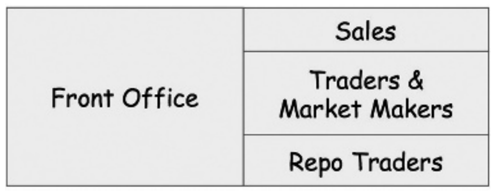

FIGURE 1.1 Investment organisation – structure

There are other, similar types of Front Office used by organisations, such as:

- **Stockbrokers** – These act in an agency capacity on behalf of clients. They can offer “execution only” (without any advice) brokerage, non-discretionary services (provide advice but can only trade subject to a client’s instructions) and fully discretionary services (the broker decides what to do based on the client’s overall investment objectives without seeking case-by-case instructions).
- **Market makers** – These make their money by using their company’s capital to quote bid and offer (buy and sell) prices in pre-specified securities. Market makers are obliged to make a two-way price in any and all market conditions.
- **Investment managers** – These use their clients’ cash to make investment decisions in accordance with the clients’ investment objectives. Having made the investment decisions, orders are placed with their brokers for execution in the market.
- **Broker/Dealers** – These can act as both a dealer (trading for the organisation’s own account) and as a broker (on behalf of clients).
- **Inter-dealer brokers** – These are specialised intermediaries that execute transactions on behalf of sell-side institutions such as broker/dealers and market makers. The IDBs provide anonymity so that the market is not aware of the sell-side institution’s positions.

In whatever capacity it is acting, the Front Office executes transactions either on a stock exchange or in the over-the-counter (OTC) markets.

1.2.2 Middle Office

Not every investment company is obliged to have a Middle Office, but the larger the company, the more likely it is to have one. The Middle Office is the link between the Front Office and the various operational departments (see Figure 1.2).

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Front Office	Sales
	Traders & Market Makers
	Repo Traders
Middle Office	Trade Confirmation & Risk Information

FIGURE 1.2 Investment organisation – structure

It both supports and controls output from the Front Office; it ensures that any trade is correctly booked and the economic consequences of the trade comply with various pre-agreed limits, for example:

- The value of the trade must be within counterparty limits;
- The value of the trade must be within the trader's limits;
- The trader must be authorised to trade that asset.

The Middle Office monitors existing trades and identifies any that do not meet these limits. Assets held in the dealers' blotters should be checked and revalued daily. The Middle Office needs to ensure that pricing data are correct and investigate prices that do not look right.

The Middle Office will exchange confirmations of executed trades with the counterparties and, where necessary, identify discrepancies, obtain the dealer's confirmation of the change and update the trading systems accordingly. Changes cannot be made without reference back to the trading floor, as it could appear that the Middle Office is actually trading rather than simply making a correction to a trade.

As part of the monitoring process, the Middle Office ensures that all the trades executed during one particular day are fully booked in the system, that valuations have been made and that reports have been produced.

Q&A

You work in the Middle Office of Masham Dealers (account number 859327) and the following transaction appears on your system:

Purchase: USD 1 million ABC 5% bonds due 15 September 2021

Price: 99.1250 plus 72 days of accrued interest (Annual, 30/360)

Trade date: 30 June 2015

Settlement date: 03 July 2015

Counterparty: Skipton Bank Limited (account number 132546)

Total cost: USD 1,031,125.00)

A few moments later, the confirmation arrives from your counterparty:

Confirmation from: Skipton Bank International (account number 132654)
Sale: USD 1 million ABC 5% bonds due 15 September 2021
Price: 99.0625 plus 72 days of accrued interest (Annual, 30/360)
Trade date: 30 June 2015
Settlement date: 03 July 2015
Counterparty: Masham Dealers (account number: 859327)
Total cost: USD 1,030,625.00

Question

What, if anything, is wrong with the confirmation, who is correct and what action would you take?

Answer

There are two discrepancies:

1. Counterparty – you have Skipton Bank Limited and the incoming confirmation has come from Skipton Bank International. Although both counterparties are from the same banking group, they are different counterparties.
2. Price – You have 99.1250 and they have 99.0625.

There is no sure way of knowing what the correct situation should be:

- Counterparty – You may have traded with both entities in the recent past, so either might be right.
- Price – If the market was showing 99.140625 (bid) and 99.203125 (offer) at the time the trade was executed, whose trade is more likely to be correct? If we are the sell-side (and therefore Skipton the buy-side), our price looks more likely to be correct. As the sell-side dealer, we would purchase at close to the bid (i.e. lower) price.

Our only course of action is to talk to the trader concerned and get him or her to check the details by contacting, if necessary, the counterparty dealer. Our dealer will have to authorise any alteration to the contract. Then, and only then, can you make the corrections in the system.

In most cases where there are discrepancies in transaction details, the Middle Office would have to investigate with the Front Office. In Table 1.2 there is a list of typical types of query together with the department that is responsible for making any changes.

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TABLE 1.2 Primary responsibilities for resolving trade discrepancies

Settlement Instruction Component	Trade Detail from which Settlement Instruction Component is Derived	Primary Responsibility
Depot account no.	Trading company	Front Office and/or Operations
Nostro account no.	Trading company	Front Office and/or Operations
Trade reference	N/A	N/A
Deliver/Receive	Purchase or Sale	Front Office
Settlement basis	DVP or RVP or FoP	Front Office
Settlement date	Settlement date	Front Office
Quantity	Quantity	Front Office
Security reference	Security	Front Office
Settlement currency	Settlement currency	Front Office
Total net amount (Principal)	Price	Front Office
Total net amount (accrued interest)	Accrued interest	Operations
Counterparty's depot account	Counterparty (Cpty)	Cpty = Front Office Cpty account = Operations
Counterparty's nostro account	Counterparty (Cpty)	Cpty = Front Office Cpty account = Operations

1.2.3 Back Office/Operations

For those organisations that do not have a Middle Office, the initial trade capture from the dealing systems would start here in the Operations area (see Figure 1.3). It is here that all the post-trade processing takes place, and this includes activities such as settlement of all transactions. Settlement requires the receipt and delivery of securities together with the payment and receipt of cash; as we will see later, we expect the movements of securities to occur at the same time as the corresponding movements of cash. We refer to this as *delivery versus payment* or *receipt versus payment* (DVP and RVP, respectively).

More often than not, securities held centrally in a type of organisation known as a central securities depository (CSD) are recorded as electronic records by the CSD. For this reason,

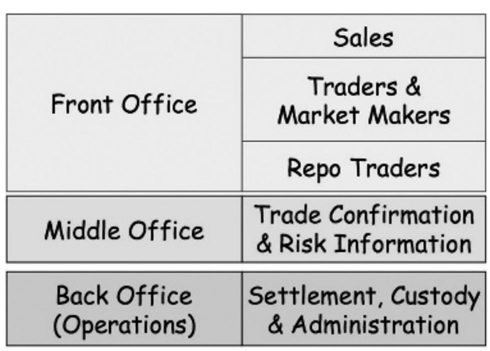

FIGURE 1.3 Investment organisation – structure

Operations will also have responsibility for ensuring that when transactions settle, the correct amount of securities is either credited (for purchase) or debited (for a sale) at the relevant CSD.

Operations may or may not be a direct participant within a CSD; if not, Operations will make use of an organisation such as a custodian bank that does have direct participation with the CSD. So we now have a custody or safekeeping responsibility in addition to settlements.

As we will see throughout this book, many of the operational responsibilities refer to the processing and final completion of transactions that have come out of the Front Office. There are other aspects to consider as well:

- Monitoring and control – Operations must make sure that any payments and deliveries are made with the appropriate level of authorisation. Authorisation can include a tested telex, an authenticated email, an authenticated fax, a signed (and possibly countersigned) hardcopy instruction or a message delivered through a secure and automated electronic messaging system such as SWIFT.
- Reconciliation – This is a key control designed to ensure that the organisation can verify that assets recorded in the books and records of the organisation agree with external statements received from counterparties, banks, custodians, etc.
- Protection of revenues – Revenues are generated in the Front Office and there will be certain, known costs that each transaction will be subject to. Examples of these costs can include brokerage fees, transaction fees, custody charges, clearing fees and stamp duty.

These represent the cost of doing business; however, if there are processing errors, there is every likelihood that there will be penalty costs associated with this. In a perfectly efficient environment where no mistakes are made, there should be no need for any penalty costs to be incurred. If, for example, a payment is made late, then it is quite possible for the interest charge to be greater than the profit made on the underlying transaction. Operations staff members have to pay great attention to detail in their attempts to avoid problems such as these.

1.3 OPERATIONS' RELATIONSHIPS

The Operations Department does not and cannot operate in isolation. It has to maintain relationships with many different types of organisation including:

- Clients – external;
- Clients – internal;
- Counterparties;
- Suppliers;
- The authorities.

1.3.1 Clients – External

These are your fee-paying clients; you provide a service for which you are compensated. Table 1.3 lists some examples.

You could be in contact with your clients on a regular basis for a variety of reasons, such as responding to their queries, taking instructions for an optional corporate action events and sending them securities and/or cash statements including evaluations and performance-related information.

TABLE 1.3 Examples of external clients

Your Organisation	Your Client (example)	Revenue
Investment manager	Pension fund	■ Management fee ■ Administration fees
Dealer/Sales	Corporate	■ Commission or loading the bid/offer spread
Broker	High-net-worth individual	■ Commission on value of transactions
Custodian bank	Insurance company	■ Transaction charges ■ Custody fees

1.3.2 Clients – Internal

Internal clients would include your colleagues in other departments such as the Front Office. The Front Office looks to you for reports and you look to it for decisions on certain types of transaction query or voluntary corporate action event. Therefore, this relationship is based on information swapping rather than fee generation. Other business functions (see below) would also be regarded as internal clients.

1.3.3 Counterparties

The term “counterparty” can have two meanings. On the one hand, a counterparty is one party to any transaction and your organisation is the second party. The term can also refer to any legal entity to which you could be exposed financially (this is known as counterparty or credit risk).

Please refer back to the transaction that Masham Dealers entered into with Skipton Bank Limited. In this case you would regard Skipton Bank as your counterparty with whom you had exchanged confirmations of the trade in ABC bonds and whom you would have contacted as a result of the discrepancies in the contract terms.

Regardless of how competitive the business is, it is always a good idea to maintain good working relationships with your counterparties.

In our example we would have a financial exposure to Skipton Bank.

Q&A

Question

What exposure(s) might you be exposed to?

Answer

If we pay Skipton Bank on the settlement date and the bank fails to deliver the bonds to us, we run the risk that the bank might decide not to deliver the bonds to us or that it has gone into default and is not able to. We call this *counterparty risk*, and it is a variation on the term *credit risk*.

If, however, we agree to receive the bonds "against payment" and the bank is unable or unwilling to deliver, then we retain the cash. This is a lower type of risk, *settlement risk*, which might expose us to *market risk* if we subsequently have to go back into the market and purchase the bonds at a higher price.

For this reason, our organisation would analyse any counterparty from a credit perspective and establish some trading limits with the counterparty. So long as the value of all our transactions with the same counterparty is within the limit, the organisation will be comfortable with this. These limits should be under constant review and if the creditworthiness of a counterparty deteriorates, the trading limits should be reduced accordingly.

1.3.4 Suppliers

The financial markets depend on a wide range of intermediaries (suppliers) to enable investment organisations to do their jobs. Table 1.4 shows a small selection of typical suppliers.

TABLE 1.4 Typical suppliers

Supplier	Description
Custodians	Typically commercial banks, custodians hold assets on behalf of their clients.
Central Securities Depository (CSD)	Securities issued in any one particular market are typically held centrally by a locally based CSD. It is here that settlement occurs having been cleared by the appropriate clearing system.
Registrar	Equities are issued by corporate entities as one way of raising capital. The issuer must know who its shareholders are. To achieve this, a register of shareholders is maintained by a registrar on behalf of the issuer.
Paying Agent	An issuer of bonds is obliged to pay interest periodically to its bondholders. The issuer pays the total amount of interest to its paying agent, who, in turn, pays the bondholders (or their custodians).
Legal profession	A vast number of legal documents are required in the financial markets for many activities such as new issues of securities. Whilst there are standard (or master) agreements available, it is still necessary for solicitors to prepare/review documentation.
Clearing systems	As part of the settlement process, clearing systems will match both sides to any transaction and check that there is sufficient asset availability before advising a CSD that the transaction can settle. Some clearing systems assume the counterparty risk from both the original counterparties – we know these clearers as *central counterparties* (CCPs).

1.3.5 The Authorities

The final relationship is that with the various governmental and market organisations that have the power to regulate, supervise and censure organisations which come under their authority.

The majority of markets require organisations to be authorised in order to participate in certain regulated activities and to be subjected to regular inspections. Failure to meet requirements and breaches of the rules can expose organisations to financial penalties, public censure and even a restriction in their business activities.

Organisations must submit reports to their regulators and comply with their rule books.

Financial organisations are businesses that are liable to pay corporation tax on profits made. There therefore needs to be a good working relationship with the tax authorities in the organisation's country of incorporation.

Corporation tax is not the only tax to deal with; other taxes include:

- Stamp duty, which might be payable in certain circumstances (typically on purchases of securities based on a pre-specified percentage of the market value of the transaction).
- Withholding tax (WHT) is often deducted from dividends paid to shareholders. Depending on the shareholder's tax status, it might be possible to reclaim some or all of this tax. In which case, the Operations Department will have to submit reclaim documentation to the appropriate tax authorities.
- Financial transaction tax (FTT), which is levied on certain types of transaction (stamp duty is one such example). The European Commission has proposed the introduction of an EU FTT that would impact transactions between financial institutions. The charge for equities and bond transactions would be 0.1% and derivatives contracts 0.01%. In 2011, it was expected that this FTT would raise EUR 57 billion annually.[2] The proposal, supported by eleven EU Member States, has been approved by both the European Parliament and the Council of the European Union. Details, however, have yet to be decided.

1.4 OTHER BUSINESS FUNCTIONS

There are other business functions that work outside of the direct Front Office/Middle Office/Back Office triangle but are nevertheless important elements in a well-run investment organisation. Again, the exact management of these functions depends on the size of the organisation and how it chooses to run its own business.

These functions include:

- Accounting
- Compliance
- Human Resources
- Information Technology/Systems
- Internal Audit
- Risk Management
- Treasury.

See Table 1.5 for details.

[2]Source: EU Inside (online). "The EU Expects 57 Billion Euros a Year from a New Financial Tax." Available from www.euinside.eu/en/news/the-eu-expects-57-billion-euros-a-year-by-a-new-bank-tax. [Accessed Thursday, 10 April 2014]

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TABLE 1.5 Other business functions

Business Function	**Overview**
Accounting	Financial Accounting: Recording business transactions in the general ledger and preparing financial accounts (Profit & Loss, Balance Sheet, etc.). Reporting tends to be backward-looking (e.g. information for a previous period). Management Accounting: Measures, analyses and reports information to enable managers to make decisions on future business objectives. Reporting tends to be forward-looking (e.g. budget for the next 12 months).
Compliance	This function ensures that the organisation complies with appropriate regulations, laws, internal policies and contracts, identifies non-compliance and initiates corrective action.
Human Resources	A key resource in any organisation, it is the management of staff recruitment, learning and development, assessment and compensation.
Information Technology/Systems	The financial industry is concerned with the storage, retrieval, transmission, interpretation and security of information. Computers with databases, spreadsheets, telecommunications, etc. enable this to happen and have replaced paper-based storage (ledgers) and manual processes. High-speed networks have led to electronic and algorithmic trading that can execute thousands of transactions in milliseconds. The Internet has enabled instructions and information to be sent quickly and securely, making many proprietary transmission systems redundant.
Internal Audit	Provides independent assurance that an organisation's risk management, governance and internal control processes are operating effectively. Internal audit is independent from the business operations and reports to the organisation's board and senior management.
Risk Management	Financial institutions are exposed to a number of risks, including: ■ Credit risk, ■ Market risk, ■ Liquidity risk, ■ Business environment risk, and ■ Operational risk. The primary objective of the operational risk management function is to minimise the occurrence and impact of operational risk events, in particular avoiding extreme or catastrophic events, in order to support the organisation in achieving its strategic objectives.
Treasury	A Treasury Department focuses on customer dealing business, servicing the organisation's banking book, supporting credit business by offering treasury products, managing liquidity (daily cash flow) and conducting limited trading activities.

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1.5 SUMMARY

An Operations Department is the "engine room" of an investment organisation and the conduit along which transactions that have been executed in the Front Office flow.

Operations have a processing role – ensuring that these transactions are completed (settled) in an accurate and timely manner.

Operations also have a supporting role – they help the Front Office by reducing costs and making sure that any profits are not reduced through late interest claims.

Operations have a safekeeping role – ensuring that assets are held in custody and are only released on properly authorised instructions.

Operations do not work alone – they provide information to other functions and require resources such as staff (Human Resources) and cash (e.g. Treasury). To do this effectively, Operations maintain many different types of relationship, both internally (e.g. with the Front Office) and externally (e.g. with counterparties, clients, custodians, etc.).