

CHAPTER 1

An Introductory View to Banking, Development Banking, and Treasury

We have mentioned that our focus is going to be any treasury activity carried out by a traditional financial institution, a development bank, a corporation, or a government. When discussing the issuance of debt we will indeed draw examples from all four types of entities listed; however, when the objective will be a deeper understanding of several concatenated activities, we shall focus on the former two types of institution: investment banks and development banks. Furthermore, our view will narrow toward development banking not only because it is a special concern of ours but also because, in its simpler type of financial activity, it offers an opportunity to isolate clearly the different functions of a bank. A development institution that uses the tools of investment banking (we shall see in Section 1.6.1 that some do not) offers the simplest type of banking activity, a type made up of instruments upon which traditional investment banks have built increasingly more sophisticated ones; the higher level of sophistication, in our situation, does not translate necessarily to a better understanding.

In this chapter we shall introduce the fundamental activities of a financial institution as lending, borrowing, investing, and asset liability management (ALM); we shall try to present them in this order so as to follow the business line that goes from the client's need for a loan, through the bank's need to fund the loan, and then invest the income generated and hedge the potential risks. We shall then conclude with a sketch of the structure of a typical financial institution and a definition of the type of development bank we shall be dealing with.

1.1 A REPRESENTATION OF THE CAPITAL FLOW IN A FINANCIAL INSTITUTION

Before offering an introduction to fundamental banking activities, let us focus on a schematic representation of the flow of capital within a financial institution. As we have said before, we shall use a development institution as an example, since it encapsulates at least the fundamental aspects of banking plus a few additional features.

In Figure 1.1 we show the capital inflow and outflow to the treasury of a development institution. In Section 1.6 we describe which type of institutions obtain their funds in which particular way, but here we attempt to describe in a general way how development institutions obtain their funds and what they do with them.

A development institution, like many institutions, has shareholders who have brought a certain initial amount of equity to the institution and own a share of it. The sum of all these contributions constitutes the majority of the institution's equity. Additionally, and this is peculiar to development organizations, there are donors' contributions. These contributions can be made either by the shareholders themselves or by other entities; they can

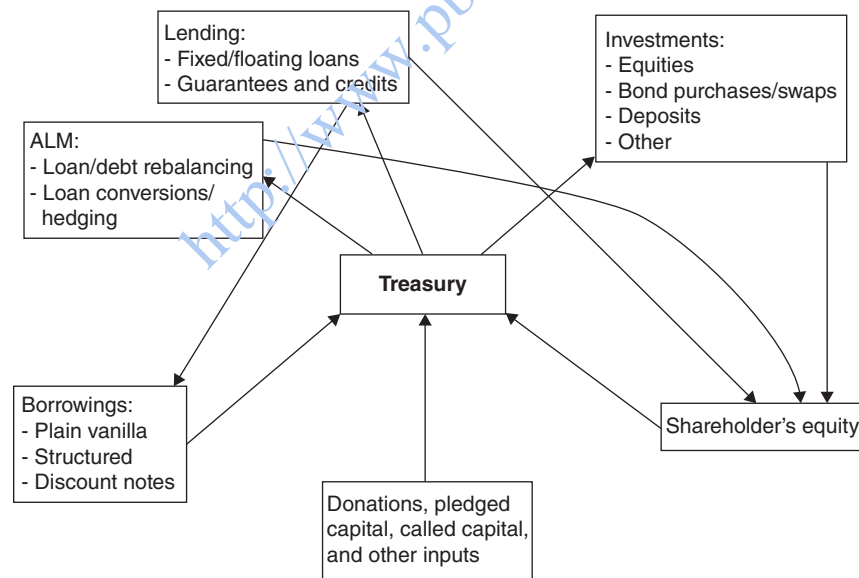


FIGURE 1.1 A schematic representation of the inflow and outflow of capital to the treasury of a development institution.

actually be given to the institution or they can be *pledged*, meaning that they remain with the donor until the institution asks for it. These contributions can be offered or, when coming from the shareholders, they can be requested by the collection of shareholders.

An additional inflow of capital, and the main topic of this book, is debt. In Section 1.3 we introduce how borrowing fits within the general activity of an institution and define the varieties of those instruments. Throughout the rest of the book we describe how debt is priced.

The main outflow, and the reason for being a development institution or a commercial bank, is lending. In Section 1.2 we introduce how lending takes place in relation to clients' needs. Income generated by loans is used to repay the debt; any additional return flows into the institution's equity.

The role played by the investment unit of a development institution will be introduced at a general level in Section 1.4 and in more detail in Section 6.4.2. Its main mandate is essentially to prevent depreciation in the institution's equity and to provide emergency liquidity to its lending unit. Investments' returns flow back into the institution's equity.

Finally, the institution's capital is also used for asset liability management, which will be introduced in Section 1.4 at a general level and then in detail in Chapter 7. Its main mandate is to balance debt and income and to hedge high-level exposures. It is an activity that should be more or less return neutral; however, any positive return would flow into the institution's equity.

Having sketched the general movement of capital within a development institution, we can now begin introducing its main activities in more detail before—in the subsequent chapters—getting into even greater detail by adopting more analytical tools.

1.2 LENDING

A bank is a firm whose core business is dealing with money itself. A bank exists and profits from making money available to others. To *make money available* is an intentionally vague expression because the ways banks *inject liquidity* (a favorite journalese expression meaning helping to increase the circulation of money) into the world are multiple and some are more direct than others. The simplest, and the one we shall focus on, is through lending money to whoever needs it (and, of course, qualifies for it).

A loan is the main instrument of lending and the one we shall discuss at length throughout the book. In Section 3.1.1 we give a rigorous definition of it, in Section 3.3.1 we discuss its valuation, and in Chapter 7 we discuss its relationship to debt. Here we are simply going to introduce a loan in the context of a description of the activity of a bank. If we allow for the

statement that, irrespective of the sophistication of a banking activity, the business of a bank is lending, we can simply focus on loans, and for that matter the activity of a development bank is sufficient for our discussion. Any additional activity a traditional financial institution, such as an investment bank, carries out can be seen as built on this.

Who are the clients facing a development bank, the entities needing a loan? A typical client of a development institution is a sovereign or private entity most often associated with the developing world; such client would seek the help of a development bank because to do the same in the capital markets would be too expensive or downright impossible. The need for a loan can be associated with a more or less specific development project that the sovereign or corporate entity envisages to carry out. The term *development project* is vague but we can imagine it including building schools and hospitals, developing infrastructure and power sources, even developing a basic capital market. We can imagine it excluding unnecessarily the strengthening of armed forces or building infrastructures closely linked to the ruler or the ruling party (e.g., a road to the ruler's estate).

Not all projects benefit from the same type of loan, and the role of a development institution is to construct the lending instrument around the needs of the client. We now present some of the possible types of loans in the context of the type of project.

- **Loan versus credit or guarantee:** The first choice facing a development institution offering financial help to a borrower is whether this help should take the form of a loan, a credit, or a guarantee. A *loan* is an instrument where the repayment of the principal is linked to some market-driven variable; we leave this vague but it means that irrespective of whether the interest rate is fixed or floating (see the following), it is driven by some market considerations. A *credit* on the other hand is an instrument where the repayment is usually made of a nominal (small) rate. Finally, a *guarantee* is not an offer of funds but a guarantee to honor a promise made by a borrower that an investor will purchase a bond issued by some country with the understanding that, in case the borrowing country defaults, the development institution will step in to honor the debt. In general, the wealthier the borrower, the more likely it will be offered a loan rather than the other two instruments. Another general rule is that the size of a credit or a guarantee is usually smaller than the size of a loan.
- **Bullet versus amortizing loans:** A project that might be more or less capital intensive and it might offer returns in a more or less gradual way. A way for the lending institution to accommodate the needs of the client is to issue a loan with a specific repayment profile.

A loan (we shall see this in more formal detail later) consists of a series of repayments of interest and principal, with the principal, as the name suggests, being the main component of the loan. Should the principal repayment prove to be difficult for the borrower, a solution is made available through a *bullet loan* in which the borrower throughout the life of the loan repays only the interest¹ and the principal is returned only at maturity. Let us imagine that the borrower needs the funds to build up the country's energy industry; these projects, ranging from dams to oil exploration, usually require a large initial investment, a long time to build, and then must produce a fairly regular source of income. During the build-up period it would be difficult for the borrower to repay the principal, therefore, in this situation, for example, a bullet loan would be ideal.

A lender is, however, hesitant to issue too many bullet loans. This will be treated more formally when dealing with the issue of credit, but it is easy to see how the further into the future we push the repayment of the main part of the loan, the more—particularly when dealing with countries and projects fraught with uncertainty—we place ourselves in a riskier situation. Because of this, the more standard form of loan is an *amortizing loan*, one where, at each interest paying date, the principal upon which the interest is calculated is partly repaid.

- **Fixed-versus floating-rate loans:** The interest repayments on a loan are a percentage amount that can be either the same at each repayment date (a *fixed-rate loan*) or variable, linked to some external parameter (a *floating-rate loan*). The choice of loan on the part of the borrower and the lender will be mainly driven by considerations linked to the financial markets of the currency in which the loan has been issued. The volatility of interest rates and the expected levels of inflation, all compounded by the length of the loan, will be deciding factors in the choice. Similar to the previous situation in which the choice was about which repayment profile, the choice of fixity in the interest repayments will be a balance between the borrower's needs and the lender's ability to deal with financial risk.

Development banks are typically very risk averse and will usually try to convert both costs (from their own borrowing, which we shall see later) and income (from loans repayments) into an easy-to-interpret and manage cash stream. Fixed- and floating-rate loans offer the lender different risk profiles with typically a preference for floating-rate loans.²

¹In the mortgage world, these type of mortgages are indeed known as interest only.

²To offer another comparison with the mortgage world, with the exception of the United States, fixed-rate mortgages tend to be less frequent than they used to be.

- **The currency of the loan:** An important issue is the currency in which the loan is offered, important also because the currency will decide which interest rate regime will govern the loan (i.e., if the loan is in currency X, it will be X interest rates that both borrower and lender will examine in their decision for a floating- or fixed-rate loan).

The return on the investment the borrowing entity is hoping to obtain will drive, as it did in the previous cases, the choice of currency of the loan. We mentioned the example of oil extraction as a possible project: should the project be successful, the income generated will be in U.S. Dollars (USD) since oil is a global commodity priced in USD. The borrowing country will then be motivated to take a loan in USD. In the case, for example, of the construction of a dam to provide electricity to local customers (who are expected therefore to pay for consumption in local currency) the income generated will be in local currency and therefore the borrowing country would prefer the loan to be in local currency. We can easily see how from the borrower's point of view it would be desirable to match, currencywise, the income stream with the debt stream.

A similar and therefore symmetrical wish is on the lender's part. Development banks are usually financed (as we shall see in the following section) in strong currencies³ and therefore would like to match the income they receive with the costs they face. A development bank would rather issue a USD loan than a local currency loan. Furthermore, a local currency loan is more subject to devaluation and/or inflation. An intuitive rule of thumb would be that anyone would rather receive income in a strong currency and pay debt in a weak one. As a consequence of this, local currency loans usually constitute a small, yet far from negligible portion of a loan portfolio.

The needs of a borrower are assessed at the moment of deciding the type and amount of loan. It is considered that the borrower will face certain costs throughout the life of the project, and the loan should be used to cover those costs. These costs, however, could change dramatically—driven by changes in the foreign exchange—after the issuance of the loan and this is because of a third currency other than the strong and the weak mentioned before (e.g., the borrower needs to purchase equipment in a third country). To manage this type of exposure there are also

³The definition of strong currency is not a precise one but it is usually intended to include USD, Euro (EUR), Japanese Yen (JPY), and sometimes British Pound (GBP) and Swiss Franc (CHF). In general, strong currencies are those currencies in which foreign reserves are held.

multi-currency loans that are issued, linked not to a single currency but to a basket of usually strong currency.

Here we have presented very briefly the type of choices facing a borrower and a lender when deciding which type of loan is best suited to the financing of a project. We now take on the point of view of the development institution and observe the different types of debt we can use to finance these loans.

1.3 BORROWING

The type of development institutions we are concerned with are those (we discuss them in more detail later) that use the tools of investment banking toward development, that is, they use their superior credit to borrow in the capital markets and then use the funds raised toward lending.

The debt profile of a development institution is one that should at the same time be in tune with its income profile (by income profile we mean the types of loans issued as discussed in the previous section) and capable of maximizing investors' needs. We shall discuss this at great length in the following chapters but, it is almost obvious, a bank should issue debt that can be considered as attractive as possible in the eyes of investors, otherwise not only will it be difficult to place, it will also be unduly onerous to serve.

In a way similar to the one adopted in the previous section we give a brief and informal description of the type of choices an institution has to make when it comes to funding through debt. The description is informal in that all mathematical and/or rigorous formalism is left for later parts of the book.

- **Currency of debt:** In the previous section we mentioned that any financial player tries to match the currency of its debt with the currency of its income. A development bank issues loans in at least a few strong currencies and, as we have seen, in some cases also in weak currencies. Assuming that for any institution there is only one mother currency, the other currencies, weak or strong, need to be obtained in order to be subsequently disbursed in the form of a loan. This could happen either by converting the institution's principal currency to the currency needed for the loan or, as in most cases, by issuing debt in that currency.

Issuing debt in a specific currency not only has the advantage of matching the currency of a loan but also, as we shall see more formally in Section 6.2.1, has the advantage of exploiting investors' appetite for the institution's debt. Let us consider development bank ABC, which has a certain credit rating and is USD centered, meaning that its main currency of business is USD. Let us assume that in the United States there are other

institutions similar to ABC, both in nature and in credit standing, but in Japan there are none. This absence results in a great interest on the part of Japanese investors for debt of ABC's kind. It would make sense for ABC to issue debt in Japanese Yen (JPY) since, all things considered, it would receive more favorable terms.⁴ Now, ABC is in possession of a certain amount of JPY, which is not only needed for a loan, but results in an advantageous servicing of debt from its own point of view.

- **Profile and tenor of debt:** The careful balance between a bank's cost and income shall be treated rigorously in Chapter 7, however, it is quite intuitive to imagine that, the same way we would like to match the currency between debt and income, it would be ideal to try to match the tenor and general structure of our debt and our loans. As we shall see later, this turns out to be rather complicated.

We mentioned in the previous section that bullet loans are extremely rare. It turns out that amortizing debt in the form of bonds with an amortizing principal profile is also rare. This means that there is an initial and fundamental mismatch in the principal profile of the debt issued by the institution and the income it receives in the form of loans. In Section 3.1.1 we shall attribute this difference principally to the fact that bonds tend to be securitized instruments as opposed to the overwhelming over-the-counter nature of loans. A second fundamental difference is driven by credit. It is almost a universal truth that borrowing over the short term is cheaper than borrowing over a longer one. Since, despite being not-for-profit organizations, development banks have some fixed costs and cannot operate at a loss, they are obliged to have a shorter average maturity for debt than for loans. This is what ensures, in principle, a small positive net income. However this also ensures that, as far as maturity and principal amortization are concerned, bonds and loans will never be matched and this can lead to serious risks.

- **Fixed or floating rate:** The choice, on the part of an institution, to issue fixed- or floating-rate debt is driven, like the one of currency, by a balance between the borrower's need and the investors' appetite. As in the case of a loan, a *fixed-rate bond* is one where the investor receives the same percentage amount of principal at regular intervals and a *floating-rate bond* is one where that amount is variable and is linked to some external parameter. Although, as we said, the tendency on the part of the lender (i.e., the bank) is to prefer the disbursement of floating-rate

⁴We shall give a formal definition of what "all things considered" means when discussing asset swap spreads when we shall also be able to understand formally what we grasp intuitively as to the meaning of "favorable terms."

loans, there could be situations in which, in response to great investors' interest in a fixed-rate bond, the bank is in the situation in which the fixed-rate nature of the loan matches the one of the bond.

- **Vanilla or exotic:** A debt instrument can be anything in terms of complexity. It can be a bond paying a simple coupon (fixed or floating), it can be a coupon offering the payout of a simple option (a call or a put on a familiar⁵ underlying), or it can be a coupon linked to the payout of an exotic option, that is, an option whose payout is complex and needs a serious computational effort in order to be priced. These payouts can include a combination of caps, floors, values linked to past performances (look-back features), spreads, and so forth. The reason behind the choice of more or less complexity, that is, more *vanilla* or more *exotic*, in the type of debt issued is linked to a search for more attractive funding levels. This will be explored in detail in Section 6.2.1.
- **Debt managing tools:** We have mentioned quite a few times the concept of matching. Ideally a development bank would try to make sure that the nature (in terms of amortizing profile), currency, and fixity of rate of its debt is similar to the one of its income, that is, its loans. This, we have seen, is not always possible. We have also said that development banks are generally risk averse and prefer to be exposed to the smallest number of financial variables. A development bank would usually choose one currency and one type of rate and take them to be a measure of all things, so to speak. A U.S.-based development bank would, for example, choose USD to be its principal currency and a certain floating rate, for example, the LIBOR rate resetting every six months, to be its principal rate. (We have not defined the LIBOR rate yet, but for the rest of the chapter we shall simply treat it as some generic variable rate.) This means that all income and all debt that does not match the USD six-month LIBOR profile needs to be converted into it. A USD fixed-rate loan would need to be converted into a similar floating-rate loan, then the bank would seek to enter into a contract with some other party in which it pays the fixed rate received from the loan and receives a floating rate in return. A similar, if opposite, situation would be needed to convert a USD fixed-rate bond. The bank would enter into a contract paying a floating rate in USD and receiving the fixed-rate coupon in USD, which goes on to the investor. What applied to fixity also applies to currency. Should the loan be fixed (or floating) in, say, EUR, the bank would seek to enter

⁵By familiar we mean interest rate, equity, or FX: although the term familiar is not a standard one, even a simple option linked to credit or commodities would probably not be considered so simple.

into a contract in which it would pay another party the fixed (or floating) coupon in EUR it receives from the loan and it would obtain in return a floating payment in USD. A similar, if opposite, contract would be needed to convert a fixed (or floating) rate bond in EUR. These types of subsequent contracts are known as *swaps* and will be discussed at length later.

1.4 INVESTING AND ALM

The main source of income for a development bank is the revenues from its lending business. There is however usually, as in any normal financial institution, considerable investment activity taking place. In Section 7.1 we shall discuss where a development bank's funds come from and what percentage they constitute of the loan portfolio. Here we simply state that a bank is in possession of funds of its own that are independent of those raised through debt. We have seen in Section 1.1 that these funds can be made of equity and other assets or in the specific case of development institutions they can be donations or requested capital. We have also seen that these funds are also replenished by the net income (i.e, a profit, should there be one) given by the sum of the inflows from the loans and the outflows of the debt.

In a traditional financial institution these assets can be used to reward employees or shareholders (or partners) or can be used for other specific activities such as share buybacks. In a development institution, which of course is not for profit, they are mainly used as a buffer. These assets are held and nurtured not only to mitigate some of the institution's risks but also to provide a safety net in case a borrower should default on a bank's loan. In Section 7.1 we shall discuss the concept of capital requirement, but it is already quite easy to grasp that a situation where a large portion of a loan is funded through cash is less risky than one where the loan is almost completely funded through debt. A further requirement on the type of investment carried out with these funds, so that they can be used as a buffer, is that they need to provide *emergency liquidity*: they need to be invested in assets so liquid that, should there be the need to repair the damage caused by a defaulting borrower, they can be liquidated at a moment's notice. We shall see this in more detail in Section 6.4.2.

Some of these assets are also used by the fourth main activity of a development institution, which is asset-liability management (ALM), the activity that tries, using our previous term, to match in the best possible way loans and debt.

What are some of the activities carried out by the investment and ALM arm of a development institution? As we have stressed already quite a few

times, a development institution is rather risk averse, therefore these activities are considerably less adventurous than those carried out by a similar *prop desk* in a traditional investment bank.

- **Currency risk management:** One could look at things philosophically and claim that currency risk is one of the most insidious because it makes us aware, particularly in our globalized world, that there is no such thing as an absolute frame of reference and everything is relative to something else, in this case, the rate of exchange between currencies. These types of considerations aside, a development bank, like any institution, is subject to currency risk and at the same time stands to gain from it.⁶

A way to protect and/or gain from currency exposure is to either trade instruments—such as the one mentioned in the previous section where cash flows are linked to floating interest rates in different currencies—or simpler, purely currency-related instruments—such as one where cash amounts in different currencies fixed in the present are exchanged at future dates.

- **Interest rate risk management:** We shall later see, and understand, how a development bank's business is essentially a fixed-income business where interest rates play the dominant role. We have already seen how a development institution prefers to see everything in terms of one specific standard interest rate. To this end it would trade instruments converting any floating- or fixed-rate cash flow not conforming to its chosen standard into that standard rate. Later we shall learn that this standard rate, like similar other rates used in the market, is called a benchmark. This benchmark is also used to measure similar trades made by the investment arm of the institution to gain from exposure in the interest rate markets.
- **Inflation risk management:** Inflation is the great enemy of the creditor and the prudent. Any holder of substantial assets stands to lose from the eroding effect of inflation. Given that development institutions are, particularly when compared to traditional investment banks, considerably better funded than the average institution in terms of liquid assets, they would in principle stand to lose a great deal from the effect of inflation. To this end some of the investment energy of the bank goes toward purchasing protection against inflation. The simplest and least adventurous

⁶To be precise, a risk by definition is something one can stand to gain something from, however, in a risk-averse view, one tends to see risk as something dangerous—and therefore, here we choose to stress the profit opportunities next to it.

kind of protection is given by government bonds where the principal does not remain fixed but grows with inflation.

- **Investment and liquidity creation:** The final high-level objective is the one of not letting the institution's equity depreciate (for reasons other than inflation) by investing it with a certain target in mind. The type of investments need to be of the most liquid kind so that they can be sold/unwound in order to provide an emergency buffer for the institution. These investments can be of the spot kind, such as buying and selling shares or foreign currency; they can involve placing deposits abroad and swapping the income into USD (or the native currency of the institution); they can involve purchasing different type of debt (sovereign, agency, corporate) and swapping it into the native currency; or they can involve investing in more exotic instruments, such as asset-backed securities (ABS), and swapping the income into the native currency of the institution. We shall revisit these in Section 6.4.2, however, it is already easy to see how different mixes with different proportions of each of the above result in different risk profiles.

After having given a very high-level description of what the fundamental activities of an investment bank and particularly a development bank are, let us try to paint a schematic structure of the internal organization of these institutions.

1.5 THE BASIC STRUCTURE OF A TRADITIONAL FINANCIAL INSTITUTION

Each financial institution has its own structure which can vary according to size, profitability, geographical location, and so on, however, we could try to sketch a skeleton structure that describes the average investment bank. Let us remind ourselves that our goal is to locate the treasury within an institution and therefore what matters to us particularly is the interaction between the treasury desk and the other parts of the bank. This is important because, as we will try to prove throughout this book, one cannot judge the value attached to a financial instrument without considering where the liquidity financing it comes from.

1.5.1 Private and Public Sides

The first crucial distinction is between a private, client-facing side and a public, market-facing side. The distinction is important under a legal point of

view in the sense that the former deals with private and confidential information that the latter deals with information which is open to the general public. The two are separated by internal controls (the famed Chinese walls).

On the private side of an institution are all those units dealing with products tailor-made to suit the needs of a specific client. These could be mergers and acquisitions, flotations of companies including underwriting (the promise to buy a certain amount of issued assets); it could be leveraged buyouts in which a client company is helped to raise (a significant amount of) debt in order to acquire another company. It could also be lending, a topic close to our scope; lending might lead to loan syndication, which consists of taking a loan and parceling it out to other financial institutions. All these activities hinge on confidentiality since they rely on very sensitive information, information that should not be disclosed either to the general public or, even more crucially, to the rest of the institution. The profit generated by the private side of a bank is made of fees, either up front as in the case of advisory roles or in terms of spreads over some reference rate in the case of loans. The liquidity needed for these types of activities (for example, to underwrite a stock issuance) is usually greater than the profits generated, meaning that it must come from the public side of the bank.

On the public side there is what is sometimes described as the capital markets division, which is made up of the sales and trading desks. Information on this side is not confidential; it is public and open for everyone (with access to a broker's screen) to see. One could argue that it is in everyone's interest that the information is as open as possible: the liquidity we have praised in the previous sections is directly proportional to an open access to information. Since our focus is, at least as far as the valuation of financial instruments is concerned, on activities carried out on the public side of a financial institutions, we shall describe them in greater detail.

1.5.2 Sales and Trading Desks

Trading activity is usually divided by asset class: equity, commodities, and fixed income (which includes interest rates, credit, and foreign exchange). The type of trading can roughly be considered as belonging to one of three kinds: proprietary, meaning that it is carried out with the bank's money; on behalf of clients for those banks who are market makers (institutions offering a two-way price on selected financial instruments); or as a hedge of the bank's positions. Within each asset class (with some variations taking into account characteristics that are specific to a certain asset class) trading desks vary according to the complexity of the traded instruments. There are the cash desks, carrying out the simplest type of activity, which can be trading shares in equities or spot foreign exchange (FX) rates in FX, vanilla options

desks, and exotic options desks,⁷ On each desk there can be a mixture of trading for proprietary purposes or on behalf of clients. Almost all traders need to trade for hedging purposes since they need to mitigate the risk in their portfolios. Proprietary trading, as a consequence of the 2007 to 2009 financial crisis, is disappearing, particularly within those institutions that have accepted government intervention.

Sales desks facilitate the contact between clients and traders: a client who wants to do a simple but large transaction for hedging purposes (e.g., an exporter wanting to protect itself from all currency fluctuations) or an institution (e.g., a retail bank) wanting to offer its own clients a structured product, will contact a sales desk, which in turn will contact a trading desk. A sales commission goes to the sales desk and is a one-off percentage of the profit on the first day. The profit for the trader is calculated as a percentage of the profit of the trade throughout its life.

This different compensation structure is behind a trader's (irrespective of what the popular press might think) natural risk aversion compared to the salesperson's greater insouciance: a trade might be very costly to hedge over a long period but this has no effect, or only a small one, on the sales commission. The note on different compensations is key to understanding the difference in the alignment of interests. Not only will this be stressed when discussing the difference between a for-profit investment bank with a nonprofit development bank, but the fact that a trader has some future costs *throughout the dynamic life of a trade* is crucial toward asking the question, where do the funds come from?

When a trader decides to enter into any transaction, be it a swap, a forward, or the purchase of an option, when he needs to post collateral or pay margin calls, he needs ready available cash. Some of this cash comes from the treasury desk.

1.5.3 The Treasury Desk

Of the cash used by a financial institution, some might be the institution's own and some might be borrowed, the latter with the intent of having it yield more than it cost to borrow in the first place. In order to borrow, the

⁷Sometimes cash desks are called Delta 1 using their sensitivity to their underlying as their name (a certain move in the underlying corresponds to the same exact move in the value of the portfolio). A mathematically minded and slightly irreverent nomenclator would call cash desks Delta 1 Gamma 0; vanilla options desks Delta non 1, Gamma constant; and exotic options desks Delta non 1, Gamma non constant.

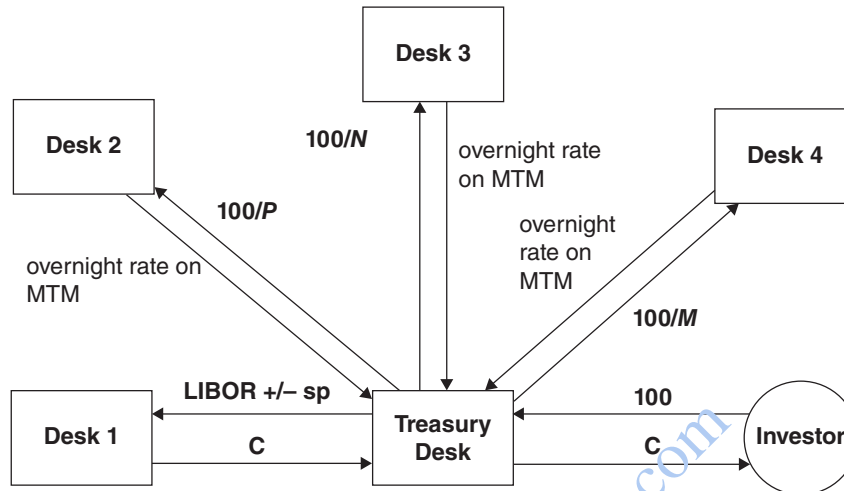


FIGURE 1.2 A schematic representation of the role of a treasury desk in relation to other trading desks. Desk 1 provides the coupon and the other desks receive the proceeds of the issuance. $100/M$, $100/N$, $100/P$ (with M , N , P some integers) are fractions of the original principal, 100, of the issuance.

institution issues bonds (which are often called *notes*) and this activity is carried out by the treasury.

The treasury desk, after deciding what type of notes investors are mainly going to be interested in, enters into a structure with a trading desk in which the following takes place: the investor pays the nominal value of the bond (100) to the treasury desk, the treasury desk receives the coupon of the bond from the trading desk and it pays it to the investor. In return the treasury desk pays the trading desk some floating rate (e.g., LIBOR) plus or minus a spread. At maturity the investor receives the initial principal (par value) of the bond.

In Figure 1.2 we have drawn a rough sketch of the situation. According to the type of note, the treasury desk would contact a specific trading desk. For example if the note is a simple fixed- or floating-rate note, Desk 1 in Figure 1.2 would be the vanilla interest rates desk. If the note is linked to a more complex payoff, Desk 1 would be the interest rates exotics desk. Should the note be linked to, say, an equity option, then Desk 1 would be an equity desk. Once the desk is chosen, the issuing of the note and swapping it with the desk takes place.

The institution, through the treasury desk, is now in possession of 100 units of cash. This can be used for the needs of the private side of the

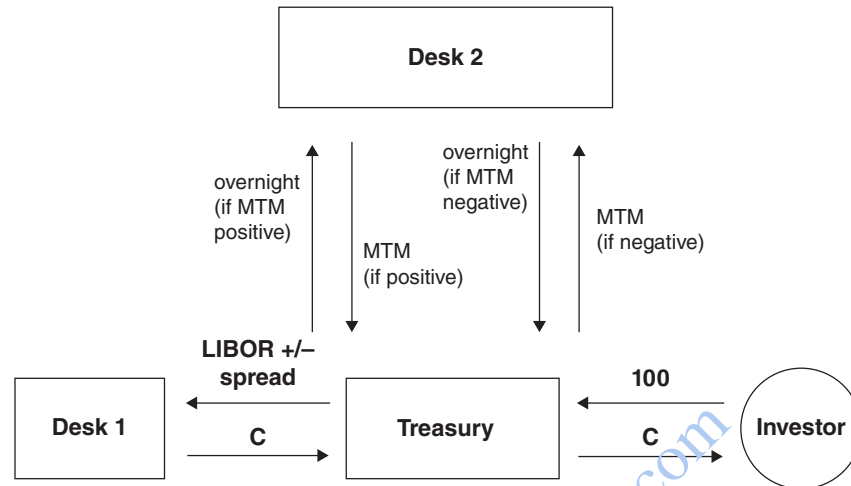


FIGURE 1.3 A more detailed version of the relation between treasury and any trading desk in need of funds.

bank (i.e., for lending purposes) or it can be allocated to the needs of the different trading desks. When a trader on, say, Desk 2 enters into a swap with a client, at the beginning of the trade there is no gain or loss for either party (we assume that the swap is entered at par). As the trade seasons, the mark to market (or MTM, i.e., the net value of the swap, which we shall discuss in Chapter 2) becomes either positive or negative for the trader. Should the MTM be negative, the trader needs to post collateral with the client, meaning that the trader needs cash. The treasury provides the cash (as shown in Figure 1.2) and the trader pays an overnight interest on this amount. If the MTM is positive, in which case the trader is owed by the client, the trader receives collateral from the client and he gives it to the treasury. The treasury, on this amount of cash (which it can use for general purposes), pays the trader an overnight rate, which in turn the trader passes to the client. In Figure 1.2 to avoid confusion we have not included the collateral going from the trader to the treasury: we have done so in Figure 1.3 where we show the two cases of MTM being either positive or negative.

Collateral management is a complicated process that is beyond our scope, however, we can easily see how changes in MTM for an institution are potentially dangerous in terms of liquidity. Although MTMs, as we shall see in Chapter 2, are netted for each counterparty at some high institutional level and therefore should be less volatile than individual ones, a change of sign from positive to negative can mean that an institution not only cannot

count on that collateral for its needs, but it needs to find some cash to provide collateral. This is one of the manifestations of the funding risk we shall observe in Chapter 7. Hedge funds, which are by definition poorly funded (the investors' money is invested in order to obtain the highest return with the smallest up front), are masters of structuring trades so that the collateral needed is kept to a minimum.

1.6 DEVELOPMENT BANKING

1.6.1 The Different Types of Development Institutions

We have mentioned development banking a few times. It would be interesting now to give some historical perspective, some names, and specific business models.

The term *development* is fraught with ambiguities and even its intent, which should be straightforward, is often questioned—sometimes even violently.

After the end of World War II it was thought that the mandate of supranational organizations, which had proved ineffective after World War I to prevent the following one, should be strengthened with an economic activity geared toward reconstruction, development, and financial stability. At the Bretton Woods agreements of 1945 the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD) were created. Although the most important outcome of the meetings was probably the system of foreign currency exchanges (in practice a worldwide pegging system that lasted until 1971 when the United States stopped converting dollars into gold), as far as we are concerned the creation of the two institutions is crucial for us as it marks the beginning of development banking.

The IMF and the IBRD both lend only to sovereign entities, but they do so with two distinct missions: the IMF's objective is financial stability, the IBRD's objective is the reduction of poverty. When it comes to lending, providing funds is only half of their activity, the second half consists of offering advice. The IMF would offer a loan to a country and at the same time offer advisory services on how to straighten its finances;⁸ the IBRD would offer a loan to a country with the idea of, say, building a road and it would also

⁸Since the receiving country cannot accept the loan without the advice, this is the controversial aspect of the IMF's mission.

send infrastructure specialists to advise the country on how best to invest the loan amount.

The crucial difference between the IMF and the IBRD, as far as the source of the money disbursed in the form of loans is concerned, is very important and represents roughly the two broad categories in which development institutions fall. The IMF lends money it obtained either through the shares sold to its member countries⁹ or through donations. The IBRD, like any normal bank, funds its loans in small part through equity, but for the majority through debt. This means that the IBRD first needs to borrow in order to lend.

The different source of funds means that the lending is itself different: whereas the rate paid on IBRD loans is driven purely by the cost of funding the IBRD itself, the rate paid on IMF loans, since there is no real cost of funding to speak of, is based on other criteria.

Other development banks originated through the years. Belonging with the IBRD to the World Bank Group, the International Financial Corporation (IFC) lends to corporate entities and it falls in the category of institutions issuing debt; also part of the World Bank Group, the International Development Association (IDA) falls instead in the category of institutions funding loans through equity and donations. Founded in 1960 when most African countries gained independence, IDA only lends to the poorest countries while the IBRD lends to middle-income countries (apart from a few exceptions, countries do not receive loans from both institutions). IDA loans charge a very low interest rate. Falling in the category of debt-issuing institutions, one could mention the Asian Development Bank (ADB), the Inter-American Development Bank (IDB), the European Investment Bank (EIB) with connections to the European Union, and the European Bank for Reconstruction and Development (EBRD), founded in 1991 with a large focus on the countries of the former Soviet block.

The IBRD played a major role in the post-war reconstruction and some of the first loans went to France and a war-ravaged Japan. The marvel that is the Japanese high speed rail system was built in the 1960s using an IBRD loan (after which Japan stopped being a receiver of loans and instead, through its vast network of retail banks, became a great investor in IBRD bonds). Despite development institutions being often criticized (more or less soundly; see for example Weaver [83], Babb [5], or Peet [69]), an alternative to an institution with an excellent credit standing, great risk aversion,

⁹When member countries joined the IMF, they bought a form of share that corresponded to their respective voting power.

and governed by large consensus within what can be described as a credit cooperative has not yet been proposed.

1.6.2 The Structure of a Development Bank

Between the two types of development bank we have mentioned, the one lending donated funds or equity and the one lending borrowed funds, we shall concentrate on the latter, as it is in essence an institution using the tools of investment banking for the purpose of development. From here onward we will refer to this type of institution when we discuss a development bank or a development institution.

The private side of the institution is the one dealing with clients, in this case borrowers (sovereign or corporate). Staff at headquarters or at country offices would deal with borrowers so as to arrange specific loan disbursements with specific projects in mind. Once the loan has been disbursed to the borrower, specific advisers work with the borrower to put the loan to its best use. Should the loan be for a project involving, say, the construction of a road through an undeveloped area, experts in infrastructures (civil engineers and infrastructure economists) from the development institution would work closely with the locals to implement the project in the most efficient way. The goal would be to spread not only wealth but also knowledge. Advisory can also come in the form of financial knowledge. A development bank might share its debt management expertise with a borrower by helping improve its debt issuance or by helping to develop or build a financial market. (In Section 4.3.1 we shall see how the action of issuing debt on the part of a development institution in an emerging market currency is in itself a move toward developing a local financial market). The bank might also help a client manage its trade inventory, for example, by swapping bonds or entering into derivatives to mitigate a client's risk.

The public side of a development bank consists of the treasury.¹⁰ The fundamental activities of banking we have mentioned in the previous sections are carried out by the treasury. The treasury ensures that the bank is adequately (and cheaply) funded to be able to serve its clients' needs. In Chapter 7 we shall see how borrowing and lending entail some very specific risks. Since a development bank (we shall also see later) does not hedge its positions, the treasury attends to the mitigation of these risks without carrying out the usual day-to-day hedging a trading desk in a normal investment

¹⁰ This does not mean that the treasury's activity is limited to the public sphere. Some of the advisory mentioned above can be carried out by its staff.

bank would practice. The main function of a treasury desk would be similar to the one carried out by structurers in a for-profit investment bank: they would work closely with investors and market counterparts to structure a bond issuance in the way most likely to lead to a low funding cost. As we have mentioned in Section 1.4, a small component of the treasury manages the equity portfolio of the bank with a very conservative approach to risk.

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