

Chapter 16

International Fixed-Income Markets

In this chapter, we have a look at one source of financing for companies: international money, loan, and bond markets. Related short-term fixed-interest products, like deposits and short-term loans or commercial paper, are briefly touched upon. Other related instruments, notably interest forwards and futures, were introduced in the Appendices to Chapters 4 and 6.

These international fixed-interest markets used to largely coincide with what was (and largely still is) called *euromoney* and *eurobond* markets, that is, markets for banking products or bonds denominated in a currency that is not the official money of the country where the loan was taken up or the bonds were issued. For example, a Norwegian investor may deposit USD not in the US but with a bank located outside the US, for example, in Oslo or in London. Or a Peruvian company may issue bonds in London and denominate them in JPY.

The prefix “euro” became misleading when such extra-territorial markets also emerged in e.g. Asia. One accordingly heard of Asiadollars, and so on. Since the advent of the euro as a currency, the prefix has also become ambiguous: are we talking about bonds expressed in EUR or bonds issued outside the home turf of the currency? Also, the term could lead to absurd combinations, like euro-euro for EUR bonds placed in London. There have been feeble attempts to find a new term; *The Economist* even invited suggestions from the public at large, and in the end backed the by no means new “xeno” proposal (from greek $\xi\nu\omicron\varsigma$, foreign). But the entire prefix issue fizzled out on its own, since people no longer thought there was anything special about setting up deals in a particular currency outside its original territory. If ever the distinction is important to you, you can just add the adjective: everybody will catch your drift. In most of this text I prefer to use “international”. The term “offshore” might have done well, too, if it weren’t for the connotation with “having a special tax status”, which is not what we have in mind right now.

In the sections that tell the tale of how the international markets emerged, we still use the euro- prefix in its “international” meaning. For simplicity, when we say euro- we also mean to include other international markets in the Middle East and especially in the Far East (Tokyo, Hong Kong, Singapore). This largely conforms to standard practice in the Americas and Europe.

The earliest activity in the international markets was in the deposit and loan segments, the segments where banks act as intermediaries between investors and borrowers. The emergence and growth of the eurobanking business was mainly the result of low costs, which enable a more narrow bid-ask spread. The success of this unregulated, wholesale banking market was soon imitated in the bond section and in the short-term securities part of the capital market (eurobonds and eurocommercial paper, respectively).

This chapter is organized in the following way: In the first section, we describe the traditional eurobanking world: markets for short-term international deposits, bank loans, and credit lines. We then discuss the counterparts of these banking products in the securities markets, namely, the international bond and commercial paper (CP) markets (Section 2). The final issue we bring up, in Section 3, is how to compare one’s fixed-financing alternatives across currencies and markets. We conclude in Section 3.

16.1 “Euro” Deposits and Loans

The banking segment is the oldest segment of the international markets. Even before World War II, there was a small market for USD deposits and loans in London, then the world’s financial heart. However, the market took off in earnest in the sixties only. We start by explaining the reasons for its rapid growth since then. We distinguish between circumstances that facilitated the emergence of the market and reasons for its longer-term success. The proximate reasons had mostly to do with bad economic-policy decisions and regulations that had unexpected consequences.

16.1.1 Historic, Proximate Causes of Euromoney’s growth

Liberalization of trade and exchange The eurodollar markets began to expand in the fifties and sixties, after the lifting of the widespread exchange controls. These controls had been imposed after World War II because of the scarcity of dollars (the only internationally accepted currency at the time, since even the GBP’s international use had become heavily controlled and regulated).

Note, however, that while liberalization of the exchange market is a necessary condition for the emergence of euromoney markets, it is not an explanation of that emergence.

The US trade deficit The liberalization of the European exchange markets was

possible only because the shortage of USD did not last long. Immediately after the war, the US launched an international aid program (the Marshall Plan). In addition, the US imported more goods and services than it exported, and US corporations became important international investors, buying companies or building plants all over the world. But, tautologically, the balance of payments has to balance, remember. So the deficit on the current account, the "capital" (aid) account, and the FDI balance meant that there must be a surplus or a set of "source" deals, elsewhere (see Chapter 2). This offsetting surplus was realized by exporting US government or corporate bonds and short-term assets, including sight money. Most countries cannot export sight money in any meaningful amounts, but the US could since its money was also the closest one can get to world money: it was used everywhere for international transactions. Thus, the US' deficit on the current account and the aid and FDI accounts meant that more and more sight money ended up in the hands of foreign investors. Foreign central banks held some too, but preferred interest-bearing forms.

Note, again, that this is not a true explanation for the rise of euromoney markets. The fact that there were foreign-owned USD does not explain why part of these USD balances were held via European banks rather than directly with US banks. The next three arguments relate to positive incentives for eurodollar transactions.

Political risks Since the fifties, the cold war created political risks for communist countries that wished to hold USD deposits: the US government could seize Soviet deposits held in New York. For that reason, the Soviet Union and China shifted their dollar balances to London and Paris, out of reach of the US government. This meant that there was a Western bank between them and the US banking system (see, again, Chapter 2).

UK capital controls and restrictions In the nineteenth century, London had been the world's center for international financing and Sterling the world's favorite currency. After World War II, however, the GBP was chronically overvalued, and the UK had serious balance-of-payments problems of its own.¹ Thus, the British government limited foreign borrowing in GBP.² As a result, UK banks borrowed USD

¹Until 1949, the GBP maintained the gold parity that was originally fixed in 1752 by Isaac Newton. (Newton was director of the Royal Mint, a sinecure job meant to leave him time for research.) This had become a very unrealistic rate in view of the increase in paper-money supply after World War I and, especially, World War II. So British exporters had a hard time while imports boomed. The UK could no longer hope that sterling balances, sent abroad in payment for its net imports, would happily be held by traders all over the world; rather, outstanding pound balances were being returned and converted into dollars. All this put pressure on Sterling. (The pound devalued by 40 percent in 1949, and by another 16 percent in 1967. Controls were lifted gradually, and entirely went out of the window only in the 1980s, under Thatcher.)

²A speculator, remember, would borrow a currency deemed weak, and sell the proceeds (hoping to be able to buy back later at a low cost), thus putting additional pressure on the spot rate. Until the 1980-90s, governments often had the lamentable habit of forbidding the symptoms rather than curing the disease. So HM's government forbade pound loans to non-residents.

(that is, accepted USD deposits), which were then used to extend USD loans instead of GBP loans.

US capital controls and restrictions In the US, the disequilibrium on the merchandise&invisibles, aid, and direct-investment balances, combined with the growing overvaluation of the USD against the DEM and related currencies, pushed up US interest rates. President Kennedy tried to alleviate the problem by imposing the *Interest Equalization Tax* (1963–74) on foreign borrowing in the US. This tax allowed internal US interest rates to remain below USD interest rates offered in Europe. President Kennedy and later, President Johnson, also imposed *foreign credit restraints* (1965, 1968–74) that hindered borrowing by foreigners in the US market. Simultaneously, *Regulation Q* (enacted in 1966, relaxed in 1974, and abolished in 1986) imposed interest ceilings on domestic USD deposits with US commercial banks. The combined effect of all of this was that US corporations and investors preferred to hold USD deposits in Europe (where they obtained better rates), and these dollars were then re-lent to non-US borrowers who were no longer allowed to borrow USD in the US. Finally, President Nixon’s “voluntary” (and later, mandatory) *curbs on capital exports* had the unintended result that US multinationals avoided depositing their funds in the US lest these funds be blocked there. The money were deposited, instead, in the euromarkets.

16.1.2 Comparative Advantages in the Medium Run

The eurodollar markets did not collapse after all of the regulations described above were abolished. Nor can the above factors explain the subsequent emergence of international markets for other currencies, like the DEM, the JPY, or the ECU, and—to a lesser extent—the CHF, NZD, NLG, etc. The long-term explanation of the success of these international markets is their lower bid-offer spread (that is, the difference between interest rates on loans and interest rates on deposits), which in turn reflects the lower costs of international banking as compared to domestic banking. There are many reasons for the low operating costs:

A lean and mean machine The international market is essentially a wholesale market, where large volumes of transactions allow narrow spreads. Eurobanks, unlike many domestic commercial banks a few decades ago, were not expected to offer politically or socially inspired subsidized loans to ailing companies or house-building families. Nor do they need an expensive retail network.

Low legal costs Most euroborrowers are sovereign states or high-grade corporations. This means that there are hardly any costs of credit evaluation, bonding, and monitoring.

Lighter regulation For eurodollar banking (as opposed to domestic banking) there is no compulsory deposit insurance, which means that there are no insurance costs. Nor are there any reserve requirements (which are, in fact, similar to taxes on

deposits),³ and local monetary authorities tended to be far more lenient as far as credit restraints are concerned when borrowing did not involve their home currency.⁴

Universal banking In the UK, like in much of continental Europe, there was no equivalent of the US Glass Steagall Act that separated commercial banking (sight and time deposits; overdrafts and loans) from investment banking (placing, underwriting, and holding securities). Although, by definition, you do not need universal banks for deposits and loans, companies still liked institutions that could both offer loans and help place their paper: both are very close substitutes. Nor was there anything, in the UK, like the US’ ban on interstate banking, a rule that imposed a cap on US banks’ growth (except for a handful of international players).

Lower Taxes Eurobanks were often located in tax havens or are part of a financial network involving tax havens. Also in mainstream OECD countries, international transactions often received beneficial tax treatment when compared with domestic businesses (for example, a waiver of stamp duties or withholding taxes; in this respect, many OECD countries have now followed the lead of tax-haven countries).⁵ Furthermore, many investors with undeclared income—the “Swiss dentist” or the “Belgian dentist”, as *The Economist* or *Euromoney* fondly call them—appreciated the opportunities for tax avoidance or tax evasion available in euromoney markets. Foreign deposits were often fiscally anonymous (that is, the bank cannot be forced to reveal their identity to a foreign tax authority), or are often in the form of bearer securities.

16.1.3 Where we are now: a Truly International Market

As Merton Miller beautifully put it, silly regulation provided the grain of sand—the thing that starts as an irritant to an oyster but ultimately grows into a pearl.⁶ The market survived the abolishment of the currency controls and excessive regulation; these had speeded up the growth of the market, but even without them a

³A 5 percent reserve requirement would mean that a bank, when receiving a customer deposit for 100, has to redeposit 5 in a non-interest-earning account with the central bank. Thus, only 95 can be re-lent. This increases the effective cost of accepting the deposit.

⁴It is true that eurobanks are subject, like any other banks, to the so-called Bank of International Settlements (BIS) rules. However, these are not reserve requirements. Rather, the BIS rules set the minimum amount of equity a bank should have, in light of its balance-sheet and off-balance-sheet positions.

⁵A stamp duty is a tax on transactions in securities. A withholding tax is a tax levied on interest or dividends, withheld when the interest or dividend is paid out (rather than collected afterwards, on the basis of a tax return).

⁶Actually, pearls do not grow in oysters (*ostreida*) but in two species closer to mussels, *perida* and *meleagrina* (aka *pintada*); and they do not start from grains of sand but from indigestible food residues. But otherwise the image is accurate.

Table 16.1: **Largest Banking Centers**

	Banking deposits Dec-05 (USD tr)	# of banks Mar-05 (number)	Branches & subsidsr of forgn banks Mar-05 (number)	Return on captl 2006 (%)	Cost/ income ratio 2006 (%)	Cross- border lending (%) Mar-07	Cross- border borrowing Mar-07 (%)
JP	5.1	129	69	16.2	69.4	9	2
US	5.2	7,540	228	22.2	59.9	20	12
UK	4.6	347	264	19.6	50.2	10	23
DE	3.1	**2,344	125	4.7	61.5	9	7
FR	1.5	**318	*217	15.7	63.9	8	9

* end-2004; ** end-2005

Source International Financial Services London. *International Financial Markets in the UK*, November 2007. www.ifsl.org.uk/research; based on Bank of England, KPMG, Banque de France, The Banker, Bank for International Settlements, European Banking Federation, Bank of Japan, FDIC, US Federal Reserve

similar market would have emerged sooner or later because there was a need for a fast, lightly regulated field for big, professional players. London and other centers provided just that.

Nowadays, however, the playing field has become much more even, and the “euro” markets’ comparative advantage was eroding fast. Wholesale, simple deals with prime borrowers can be signed everywhere. “Regulatory arbitrage”—that is, borrowers and investors migrating away from the overly regulated markets—has forced countries everywhere to dump rules, taxes and duties that did more harm than good. In the US, Glass-Steagall and the ban on interstate banking have been repealed. Currency controls are gone for most currencies, as are credit restraints and, in many countries, reserve requirements. Tax authorities cooperate internationally, and governments exchange information on foreign deposits and/or foreign investment income. Originally, this was just in cases where crime- and drugs-related money laundering was suspected or, later, terrorist activities; but cooperation for fiscal purposes is coming in too. Within the EU, information on non-residents’ income is already being shared; a few countries still impose withholding taxes instead but this will be phased out. Secret (“numbered”) bank accounts, for a long time one of the attractions of, most notably, Swiss, Austrian, and Lichtenstein banks, are essentially a thing of the past: bankers must know their customers’ identities. Tellingly, countries with a dark reputation are now being blacklisted by the OECD; when in the early 2000’s a new government in Mauritius proposed to set up a “high-privacy” banking sector, the big countries were all over her and Mauritius hastily withdrew the proposal.

As a result, there is not much difference anymore between domestic and international banking, certainly not for wholesale deals in OECD countries and the like. In that sense, in a large part of the world markets nowadays are truly international,

not just a collection of local markets with, on the fringe, an international corner for the big guys.

In the following sections, we review the products offered by international banks. The first product in our *tour d’horizon* is the deposit.

16.1.4 International Deposits

Initially, international deposits were typically *time deposits* (or *term deposits*)—that is, non-negotiable, registered instruments with a fixed life. A *certificate of deposit* (CD) is the tradable-security version of the traditional term deposit: it is negotiable (that is, can be sold to another investor at any time) and is often a bearer security.

The bulk of the deposits have a very short duration—for instance, overnight, one or two weeks, but mostly one, three, or six months. These short-term deposits or CDs pay no interim interest; there is a single payment, principal and interest, at expiration. For long-term CDs or long-term deposits (up to seven years), there is a fixed coupon or floating-rate coupon. For CDs with *floating-rate* coupons, the life of the CD is subdivided into subperiods of usually six months. The interest rate that applies for each period consists of a fixed spread laid down in the contract, and a risk-free market rate that is reset every period. Following the by now familiar “spot” tradition, this re-setting occurs two working days before the beginning of the period (the *reset date*). The market rate on the basis of which the rate is reset is usually the *London Interbank Offer Rate (LIBOR)* or the Interbank Offer Rate in the currency’s domestic financial center. “The” LIBOR and similar -IBOR’s⁷ are computed as an average of the rates offered by an agreed-upon list of banks; the EBA has standard lists. The basis of the floating rate may also be the bid rate, or the mean (midpoint) rate, or, in the US, the T-bill rate or the prime rate. If the basis rate is an ask rate (like IBOR or the prime rate⁸), the spread is usually negative: we are talking about deposits, here.

Example 16.1

An investor buys a NZD 1,000,000 floating-rate CD with a life of two years, at NZD LIBOR minus 0.375 percent, reset every six months. The initial reference interest rate is 4 percent *p.a.*, which implies that after six months the investor receives $1,000,000 \times (4 - 0.375)\%/2 = \text{NZD}18,125$. The reset date is two days before this interest is paid out, and the six-month LIBOR on this reset date may turn out to be, say, 3.5 percent *p.a.* This means that the second interest payment will be only

⁷The rule is to make the first letter refer to a city, like Aibor (A’dam), Bibor (Brussels), Pibor (Paris), Tibor (Tokyo) and so on. For the EUR one refers to Euribor; the old national IBORs have gone, including Frankfurt’s Fibor.

⁸The prime rate once was the posted rate for unsecured loans to good-quality borrowers; nowadays it is, de facto, applied to rather mediocre borrowers.

$1,000,000 \times (3.5 - 0.375)\%/2 = \text{NZD } 15.625$. There will be two more of these reset dates. At the end of the last period, the principal is also paid back. _____

You can view such a floating-rate CD as a series of short-term CDs that are automatically rolled over without reinvestment of the interest earned each period. Sometimes a floating-rate CD has a *cap* or a *floor*—that is, the interest rate that the investor actually receives has an upper or lower bound. We shall discuss caps and floors in the next section, which describes euroloans.

16.1.5 International Credits and Loans

International banks offer essentially the same products as domestic banks: loans and credit lines. But there are a few interesting differences.

Consortia

One difference is that the loans tend to be extended by a group of banks (a *syndicate* or *consortium*) rather than by a single institution. The members of the consortium or syndicate can play very different roles:

- The *mandated arranger* (or, more traditionally, the *lead bank* or *lead manager*) negotiates with the borrower for tentative terms and conditions, obtains a mandate from him to get the loan together, and looks for other banks that are willing to provide the money or at least to act as a back-up for the money. In the event that a group of banks unanimously agree to form a mandated arranger group, the title is assigned to all banks within such group. *Book runner* status is then assigned to the bank that runs the book (i.e., solicits and records the commitments by other banks to participate in the funding) for a deal that is sent out into general syndication. The book runner often leads the consortium even if arranging is, formally, shared. Bookrunnership is now, in turn, getting shared among many banks; soon we will need a lead bookrunner, and a few years from now a coordinator of the lead bookrunners.
- The banks that provide the actual funding are called *participating banks*.
- Because the funding is not yet arranged at the time of the negotiations, the lead bank or the group of joint bookrunners often contacts a smaller number of *managing banks* to underwrite the loan, that is, guarantee to make up for the shortage of funds if there is a shortage. These banks are also called *underwriters* or *co-managers* or *co-leads* or *co-arrangers*.
- The *paying agent* or *facility agent*, finally, is the bank that receives the service payments from the borrower and distributes them to the participating banks.

Any given bank can play multiple roles. For instance, the lead bank is almost invariably also the largest underwriter (hence, the name “lead manager”) and usually

provides some of the funding as well. The main objective of syndication is to spread the risks, but it also eliminates the moral hazard of the borrower paying off its bigger lenders and ignoring the small debt holders: because of the paying agent system, the borrower either defaults toward all banks, or toward none.

As in domestic banking, the borrower often signs promissory notes (that is, I owe you [IOU] documents), one for each payment. The advantage of receiving promissory notes is that they are easily negotiable. That is, if the lending bank needs funds, it can pass on the promissory note to another financial institution as security for a new loan, or it can sell the promissory note. Regular loans are not so easily traded: they need to be packed into special vehicles which then issue claims against the vehicle’s assets (loan-backed securities, collateralized debt obligations, and the like).

Until well into the 1990s a big loan would show up in *Euromoney*, *The Economist*, or *Business Week* and the like as a “tombstone”—that is, an austere-looking advertisement that trumpets the signing of a new deal. Sadly, these are now replaced by internet press releases. Figure 16.1 shows one by Turkey’s Vakifbank.

Revolving or Floating-Rate Loans

Another difference between traditional bank loans and big international loans is that the latter tend to be of the floating-rate (FR) type, whereas many domestic loans still have an interest rate that is fixed over the entire life of the loan. The reason for this predilection for FR loans is the very short funding of banks (see above): banks do not like the risk that, after having lent long-term at a fixed rate, they may have to refinance short-term at unexpectedly high interest rates. The emergence of interest swaps, however, has made the hedging of an interest gap easier. International banks now lend longer and domestic banks resort to FR loans more often too.

Example 16.2

A bank accepts a three-month, DKK 100m deposit at 4 percent *p.a.* and extends a loan for six months at 4.5 percent *p.a.* For simplicity, assume that this deposit and this loan represent the bank’s entire balance sheet. After the deposit has expired, the bank must pay $\text{DKK } 100\text{m} \times (1 + 4\%/4) = \text{DKK } 101\text{m}$ to the original lender. Since there are no cash inflows yet from the loan, the bank must borrow this amount (that is, accept a new three-month deposit). If, at that time, the three-month rate has increased to 7 percent *p.a.*, then after another three months the bank has to pay $101 \times (1 + 7\%/4) = \text{DKK } 102.767,5\text{m}$ though it receives only $100\text{m} \times (1 + 4.5\%/2) = \text{DKK } 102.250\text{m}$ from the original six-month borrower. Thus, because of the increase in the short-term interest rate the bank lost DKK 517,500 rather than making money.

In the above example, the maturity mismatch is not large because the loan is assumed to be for only six months. However, borrowers often have long-term capital needs; and rolling over short-term loans (at interest rates revised at each roll-over

Figure 16.1: An international syndicated loan: Vakifbank

\$500m Turkish bank loan syndication for Vakifbank signed in Dubai
UAE Central Bank governor addresses signing ceremony

6 December 2004; Dubai, UAE: A US\$500 million syndicated term loan agreement for Vakifbank (Türkiye Vakıflar Bankası T.A.O.) one of the strongest banks in Turkey, was signed in Dubai today by a syndicate of 56 blue-chip regional and international banks. The loan was raised to pre-finance Turkish export contracts and has a margin of 60 basis points per annum. VakifBank is currently rated Bpi by S&P, B+ by Fitch, and B2 by Moody's. On 1st of November 2004 Fitch increased the National Long Term Rating of VakifBank by two notches to A-(tur).

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Co Arrangers: Gulf International Bank B.S.C., HSH Nordbank AG, Samba Financial Group, Managers, Doha Bank, Arab African International Bank, Banque Misr – Overseas Branch, Erste Bank (Malta) Limited, Finansbank (Holland) N.V., Raiffeisenlandesbank Oberösterreich Aktiengesellschaft, The Bank of Nova Scotia, The Commercial Bank Of Qatar (Q.S.C.), The Saudi National Commercial Bank, Bahrain, UBAE Arab Italian Bank Spa

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Source <http://www.international.standardbank.com/AboutUs/PressReleases.aspx?id=232>

date) is awkward for the borrower: the bank can always refuse to extend a new loan or drastically increase the spread over LIBOR. The need to reconcile the banker's desire for a safe interest margin with the borrower's preference for long-term guaranteed funding gave rise to the *revolving loan* or *floating-rate loan*. This is a medium-term or long-term loan where the interest rate is reset every period on the basis of the then-prevailing money market rate plus a spread. For example, if interest is payable every six months, then, just like for FR deposits, two days prior to the beginning of each such period, the interest rate for the next half-year is set equal to the then-prevailing six-month LIBOR rate, contractually increased with a spread of, say, 1/2 percent *p.a.* Thus, the bank is protected against interest risk, and the borrower's funding is guaranteed for an agreed-upon period at a preset risk-spread over the base rate. The basis of the interest rate in rolled-over loans is typically the LIBOR or a similar interbank rate. Occasionally, the US prime rate or the US T-bill rate is chosen.

Table 16.2: A revolving loan with a cap and a floor

rates (%)		equivalent PN story			mood		
LIBOR	rate on loan	face value	fair PV	proceeds	bank	you	option ex'ed
3	$3.5/2 = 1.75$	101.75	100.25	100	☺	☹	bank's call
3.5	$3.5/2 = 1.75$	101.75	100.00	100			(none)
4	$4.0/2 = 2.00$	102.00	100.00	100			(none)
4.5	$4.5/2 = 2.25$	102.25	100.00	100			(none)
5	$4.5/2 = 2.25$	102.25	99.76	100	☹	☺	your put

Key The loan is about 100m, at 6-month LIBOR but with a floor at 3.5% *p.a.* and a cap at 4.5% *p.a.*. Thus the six-monthly PN the borrower has to hand over has a face value of $100 \times (1 + \text{LIBOR})$, but no lower than 101.75m and no higher than 102.25. With very low LIBOR s, when the fair value of a PN at 101.75 would be higher than 100, the borrower gets no more than 100: the bank exercises its call on the Note. With very high LIBOR s, when the fair value of a PN at 102.26 would be lower than 100, the borrower still gets 100: she exercises her put on the Note.

Revolving Loans with Caps or Floors

Sometimes there is a *cap* and/or a *floor* to the effective interest rate. For instance, the contract may say that the interest rate will never exceed 6 percent *p.a.* (cap), or fall below 3 percent *p.a.* (floor). These caps or floors are like European-type options on T-bills or on eurodeposits or euroloans. You are, of course, thinking of calls as being relevant when prices are high, and puts when prices are low. But market values of loans are inversely related to interest rates. So a floor on the interest rate is a cap on the price and vice versa:

Example 16.3

Suppose that you have a one-year, NZD 100m loan, with half-yearly interest payments capped at 4.5 percent *p.a.*—that is, 2.25 percent per half-year. The interest rate for the period that starts immediately is already known—say, 4 percent *p.a.* The 2.25 percent cap on the next six-month effective return means that, after six months, you have the right to borrow NZD 100m at 2.25 percent (effective) for another six-month period. That is, six months from now you have the right to place (=sell) a new six-month promissory note with expiration value NZD 102.25m at a price of NZD 100m—a right that is valuable to you if at the reset date the six-month rate is above 4.5 percent *p.a.* and the normal market value of a six-month 102.25m note, therefore, below 100m. In standard optionspeak, you hold a put option on a NZD 102.25m note at a strike price set at $X = \text{NZD } 100m$.

DoItYourself problem 16.1

Suppose that you have a one-year, NZD 1m loan, with half-yearly interest payments with a floor at 3.5 percent *p.a.*—that is, 1.75 percent per half-year. The interest rate for the period that starts immediately is already known; for instance, it may

be 4 percent *p.a.* or 2 percent effective. Interpret the 3.5% floor as an option on a PN: who holds and who writes the option, what type of option is it, what exactly are the terms and conditions of the underlying PN? _____

Both the example and the DoItYourself are summarized in Table 16.2.

In short, the floor on the interest rate is a call option on a promissory note, and the option is held by the lender and written by the borrower. The cap on the interest rate is a put option on a promissory note, and the option is held by the borrower and written by the lender. The reason why it is useful to re-state caps and floors as puts and calls on PN's is that a PN, unlike an interest rate, is an asset. So one can express a Put-Call parity in terms of option prices, underlying PN price, and discounted strike price. There is no similar direct link between option values and interest rates, except when prices are expressed as functions of interest rates:

DoItYourself problem 16.2 _____

Buying a European-style call and selling a European-style put still means a forward purchase, and the forward purchase at strike X still has the same value as the underlying. So Put-Call parity still takes the form

$$\left(\begin{array}{c} \text{Call pre-} \\ \text{mium} \end{array} \right) - \left(\begin{array}{c} \text{Put pre-} \\ \text{mium} \end{array} \right) = \left(\begin{array}{c} \text{market value for-} \\ \text{ward purchase} \end{array} \right) = \text{PV asset} - \frac{X}{1 + r_{t,T}}. \quad (16.1)$$

Write the PV of the asset as a function of the limit rate (e.g. the 3% from the example) and the current market rate. Show that the right-hand side of the equation can be written as the *discounted* difference between the limit and market effective rates of return.

Hasty traders occasionally ignore the discounting, and express option prices as *p.a.* percentages so as to get a link with the *p.a.* interest rates in the formula. _____

Costs of a loan

There are various costs associated with a euroloan. These include:

- An up-front *management fee* and *participation fee*, sometimes 0.25 percent and sometimes a few percentages, see below. The up-front feature means that this amount is deducted from the principal. That is, the borrower receives only 99 percent to 99.5 percent of the nominal value of the loan.
- A *paying agent's fee* of a few basis points to cover the administrative expenses.
- The *risk spread* above the risk-free rate (that is, above LIBOR in the case of a floating-rate loan, or above the long-term fixed rate paid by a government of excellent credit standing). This spread depends on the quality of the borrower, the transfer risk of his or her country, the maturity and grace period, and the up-front fee. Also, the market situation affects the spread: there are strong

cycles, with spreads widening when something bad happens, then competition gradually narrowing the spread until a new bad event happens and so on.⁹

In principle, the fees are compensation for the services of the intermediaries, while the spread is a compensation for default risk. However, one can trade a higher up-front fee for a lower spread, and vice versa. For instance, borrowers often accept a high up-front fee in return for a lower spread because the spread is sometimes seen as a quality rating. One corollary of the trading of up-front fees for risk spreads is that the spread that country X pays may be a poor indicator of the creditworthiness of country X: an ostensibly reassuring spread may have been bought off by a large upfront fee. Another corollary is that reliable comparisons between offers from competing banks can be made only if there is a single, overall measure of cost. Thus, when comparing offers from competing syndicates, one should convert the up-front fees into equivalent spreads, or the spreads and paying-agent fees into equivalent up-front costs.

Example 16.4

Suppose that an up-front fee of USD 425,000 is asked on a five-year loan of USD 10,000,000 with an annual interest payment of 5 percent (including spreads) and one single amortization at the loan’s maturity date. The effective proceeds of the loan are, therefore, USD $10,000,000 - 425,000 = \text{USD } 9,575,000$. The effective interest rate can be estimated by computing the internal rate of return or yield, denoted by y , on the transaction:

$$\text{find } y: 9,575,000 = \frac{500,000}{1+y} + \frac{500,000}{(1+y)^2} + \dots + \frac{10,500,000}{(1+y)^5}. \quad (16.2)$$

This equation can be solved on a spreadsheet or on a calculator. The solution is, approximately, $y = 6.0092$ percent, which is about 1 percent above the stated rate. Conversely, the up-front fee is equivalent to adding 1 percent *p.a.* to the stated rate.

In the above example, the future payments are known because the loan had a fixed interest rate. If the loan has a floating rate, one can no longer compute the yield because the future cash flows are unknown. However, the up-front fee can still be translated into an equivalent annual payment or equivalent annuity, using the interest rate on a fixed-rate loan with the same life and the same default risk. (To get the required number, simply ask a quote for a fixed-for-floating swap). The equivalent annuity can then be converted into an equivalent percentage spread by dividing the annuity by the loan’s nominal value.

Example 16.5

We use the same data as in the previous example except that the loan has a floating

⁹The famous hedge fund Long-Term Capital Management (LTCM) was betting on a shrinking spread when, instead, a very bad thing happened, Russia’s default. Betting again on a falling spread, LTCM was again wrong-footed, notably by the Asian crises. That was the beginning of the end for LTCM.

rate. If the normal all-in market rate on a fixed-rate loan with the same life and default risk as the floating-rate loan is 6 percent, the equivalent annuity (EqAn) of USD 425,000 up-front is determined as follows:

$$\begin{aligned} \text{EqAn: } 425,000 &= \frac{\text{eqAn}}{1+y} + \frac{\text{eqAn}}{(1+y)^2} + \dots + \frac{\text{eqAn}}{(1+y)^5}, \\ &= \text{eqAn} \times 4.212367; \\ \Rightarrow \text{eqAn} &= \frac{425,000}{4.212367} = 100,893.47 \end{aligned} \quad (16.3)$$

Thus, the up-front fee is equivalent to a spread of 100,893.47/10,000,000, that is, about 1 percent *p.a.* _____

If you ever have to do sums like this on a no-frills calculator, the shortcut to remember is

$$\frac{1}{1+y} + \frac{1}{(1+y)^2} + \dots + \frac{1}{(1+y)^n} = \frac{1 - (1+y)^{-n}}{y}. \quad (16.4)$$

DoItYourself problem 16.3 _____

If you would apply the approach of the last example to the one before, you would have found an equivalent spread of 1.0089 percent, not the 1.0092 of the earlier example. Why is there a difference? Which would you think the best figure (assuming anybody would bother about differences so tiny as this one)? _____

Credit Lines

In addition to outright loans, eurobanks also offer standby credits. These come in two forms:

- A standard line of credit (or credit line) of, say, GBP 100m gives the beneficiary the right to borrow up to GBP 100m, at the prevailing interest rate plus a preset spread. The difference between a credit line and a loan is that with a credit line the company is not forced to actually borrow the money: money is *drawn down* only if and when it is needed, and paid back at any date prior to the expiry date. Interest (in the strict sense) is payable only on the portion actually used, while on the unused funds only a *commitment fee* of 0.125 to 1 percent *p.a.* needs to be paid.

A credit line is, in principle, a short-term commitment—say, three months. In practice, a credit line tends to get extended, but this is not an automatic right to the creditor. Unless stated otherwise, the credit line can be revoked by the bank if there are substantial changes in the creditor's credit standing.

- Under a *revolving commitment*, the creditor has the irrevocable right to borrow up to a stated limit, at the then-prevailing rate plus a preset spread during an agreed-upon period of (usually) several years. For instance, a borrower

may have the right to borrow up to GBP 50m at interest of six-month LIBOR plus 1.5 percent *p.a.* This is similar to a credit line, except that it cannot be revoked during its life.

A credit line is like a single, short-lived option on the preset spread, and the revolving commitment is like a series of such options (one expiring every six months, for instance). These contracts are options, not forward contracts, because the beneficiary can always borrow elsewhere if the market-required spread drops. The credit line and the revolving commitment differ from caps in the sense that the contract imposes a ceiling on the spread, not on the interest rate.

Example 16.6

A company has the right to borrow at 1 percent above LIBOR. If the company's credit rating deteriorates, or if average spreads in the market increase, the 1 percent spread has become a bargain relative to what would have to be paid on new borrowing, and the credit will be effectively used. If, on the other hand, the company's rating improves, or if average spreads in the market fall, the 1 percent spread may be very high.

If the company uses the credit line, it still has to pay the agreed-upon 1 percent spread. However, the company can also borrow elsewhere, at a spread that reflects its better standing or the lower average spreads. Thus, the company has a cap option on the 1 percent spread.

This finishes our review of international banking products. We now describe their counterparts in the securities markets.

16.2 International Bond & Commercial-paper Markets

Almost simultaneously with the emergence of euromoney markets, firms and governments started issuing USD bonds outside the US, and sold the bonds to non-US residents. Such a bond was called a euro-dollar bond. As of the sixties, and particularly in the seventies, some eurobonds were denominated also in currencies other than the USD. Even though the dollar has long preserved its dominant market share, the fraction of dollar-denominated bonds occasionally drops below the total for European currencies, nowadays. Also in the seventies, corporations and governments started issuing short-term paper, although this short-term eurocommercial paper market did not really take off until the late eighties.

The markets to be discussed in this section are the tradable-security versions of the banking products that we discussed in the preceding section. Table 16.3 matches the eurobanking products with the closest equivalent in the eurosecurities markets. You may want to check these correspondences as we proceed.

Table 16.3: Relationships between international banking products and securities

Banking	Securities
Short-term	
Money Market – short-term loan – short-term credit line – rolled-over credit line – revolving commitment – FF, FRA	Commercial Paper (CP) Market – CP issue – CP program – note issuing facility (NIF) – revolving underwritten facility (RUF) – interest-rate futures
Medium- and Long-term	
Longer-term loans – fixed-rate loans – revolving or floating-rate (FR) loan – FR loan with cap – FR loan with floor	Notes and Bonds – fixed-rate bond – floating-rate note (FRN) – HIBO (higher-bound) bond – LOBO (lower-bound) bond

16.2.1 Why Eurobond Markets Exist

The explanations for the long-term success of international securities markets are largely similar to the ones cited for eurocurrency markets:

Lighter regulation for international public issues A bond issue aimed at the general public of one particular country is subject to many rules and regulations (although less so now than in the fifties and sixties). There are usually all kinds of publication requirements, and the issue has to be examined and approved by one or more regulatory agencies. In many countries, there are or were also issuing calendars (and, hence, queues) because the local government does not want foreigners to affect the country’s reserves, money supply, or exchange rate; nor does the government want foreigners to “crowd out” local borrowers—especially not the government itself. By contrast, “international” transactions tend to be less regulated. For one thing, monetary authorities and capital market regulators are less concerned with issues that do not involve their own currencies and are targeting a few, well-off and well-informed investors or (even better:) foreign investors. This lack of regulation is especially true for tax-haven states that are often used as launching pads for international issues, but they also hold for *private issues* in mainstream countries.

Swift and efficient private placement By traditional US standards, publication requirements in Europe were never very stringent, and no rating is required for euro-issues. Even these comparatively lax requirements can be largely or entirely avoided if the issue is private rather than public. For loans privately placed with a limited number of professional investors, there is no queuing, and there are no (or almost no) disclosure requirements. In the EU, for instance, the telling feature is whether face values of EUR 50,000 or less are being offered; if so, the issue is deemed to be targeted at retail investors rather than professionals, and a prospectus must be published,

approved by the local Central Bank. (Approval by one Central Bank suffices to sell anywhere in the Union—the so-called “passport”.) But large-denomination bonds escape all this hassle.

Simple contracts As borrowers are generally of good credit standing, eurobonds tend to be unsecured; thus, legal costs, as well as the expenses of bonding and monitoring, are avoided. Since lenders have no control whatsoever over the borrower, only well-reputed companies can play this game at a reasonable price; small players often find the risk spread they would have to offer unattractive.

Tax games Eurobonds, being anonymous bearer bonds, traditionally make it easier to evade income taxes. Withholding taxes can be avoided by issuing the bonds in tax havens, and most OECD countries have recently waived withholding taxes for nonresidents.

Large issues Issues below USD 100m are very rare, nowadays. Most issues are now 500-1000m USD or EUR, but even 5b issues are placed in a day or two (not including the unofficial bookbuilding) and no longer raise eyebrows. In 2006, the largest issue was 22b. Such a big placement allows relatively low issuing costs.

Disintermediation Since the mid-seventies, impetus for the growth of the eurosecurities market has come from the general *disintermediation* movement. Disintermediation means “cutting out the intermediary”; that is, corporations borrow directly from investors. This evolution was the result of two forces. First, in the 80s, many banks lost their first-rate creditworthiness when parts of their loan portfolios turned sour (due to the international debt crisis¹⁰ and the collapse of the real estate markets¹¹) As a result, these banks were no longer able to fund at the AAA rate, which meant that top borrowers could borrow at a lower cost than banks could—by tapping the market directly. Second, as a response to the lower profits from lending and borrowing and to the stricter capital adequacy rules, banks preferred to earn fee income from bond placements or commercial paper issues. Unlike operations involving deposits and loans, this commission business creates immediate income (rather than income from bid-offer spreads, received later on) and does not inflate

¹⁰Emerging-market debt had ballooned after, in 1974, the oil price doubled (which made many countries borrow heavily) and when a wave of inflation in the late 1970s had increased interest rates to unusual levels (much of the oil debt was at floating rates). Borrowers defaulted or renegotiated both their bank debt (in the “London Club”) and their Government-to-Government debt (in the “Paris Club”).

¹¹One background item was that, in the early 1970s, the distinction between thrifts and banks was lifted. Thrifts (or Saving&Loans) were originally cooperatives where members made time deposits and got time loans, mostly mortgage loans. Unlike commercial banks, they could not take sight deposits and give overdraft facilities. When the distinction was lifted, the old S&L were left with far less controls than commercial banks. As a result they made many bad investments, contributing to a boom and bust in real estate. The mess took years, and trillions, to sort out. The real-estate bubble also spread to Europe and hurt also the old commercial banks, most notably in the US, the Nordic countries and France.

the balance sheet.

16.2.2 Institutional Aspects of the International Bond Market

We briefly describe some institutional aspects of the international bond market.

Bearer securities Eurobonds are bearer bonds, that is, anonymously held rather than held by investors listed in a register. In the old days, “bearer” actually meant “made out to bearer”—actual pieces of paper, with coupons that can be clipped off and cashed in by the holder. The principal of the bond was represented by the mantle, the main part of the paper (after the coupons have been clipped off). In many countries, an investor can cash in coupons and principal paid out by bearer securities without having to reveal his or her identity to the bank that acts as paying agent. In contrast, if the security had been a registered security, the issuer would know the identity of the current holder of each bond, and pay interest by mailing a check. US domestic bonds are usually registered, nowadays. In the EU, even bearer bonds tend to be *non-deliverable* nowadays, that is, not physical pieces of paper; investors buy them electronically from intermediaries, but the issuer still does not keep a register.

Interest payments Eurobonds originally carried (and to a large extent still carry) fixed coupons. Coupons are most often paid annually instead of every six months (the domestic US pattern). Floating-rate notes (FRN) gained popularity when interest rates rose, in the 1970s-80s, making many borrowers hesitant about long-term fixed-rate bonds; when interest rates are low, in contrast, investors tend to be the party that shuns fixed interest rates. In a floating-rate loan, the interest rate is periodically reset on the basis of the then-prevailing LIBOR for that horizon plus a preset spread. Sometimes, the FRN has a cap or floor on the floating interest rate. Capped FRNs are sometimes called *HIBO bonds* (*higher-bound bonds*), and floored FRNs *LOBO bonds*. *Perpetual FRNs* were briefly fashionable in the mid-eighties.

Amortization Amortization of the bond’s principal amount typically occurs at maturity. Such bonds are known as *bullet bonds*. Alternatively, the borrower may undertake to buy back predetermined amounts of bonds in the open market every year. This is called a *purchase-fund provision* or a *sinking-fund provision*. Under a variant provision, the borrower does not have to buy back the bonds if market prices are above par. Instead, the borrower has a right to call a predetermined part of the issue every year.

Currency of denomination The currency of denomination of the bonds is most often a single currency (especially the USD, DEM or, now, EUR, JPY, and CHF). Also the private ECU gained some popularity as a currency of denomination in the early-to-mid 1990s. Other currency baskets, such as the SDR or the European Unit of Account, have never really caught on. Some bonds have currency options attached to them. Such currency options bonds are discussed in Chapter 8. Occasionally, you also see a dual currency bond, which pays out its coupons in one currency and

the principal in another currency.

DoItYourself problem 16.4

Suppose that the holder of a five-year bond receives an annual coupon of USD 500 and can choose to receive at maturity either USD 10,000 or EUR 10,000. Taking the USD as home currency, you can describe this bond in two ways, one involving a put and one involving a call. Find these two descriptions, and link them via Put-Call Parity.

Stripped bonds Bond stripping essentially means that the coupons and the principal components of the bond are sold separately. If bonds are actual pieces of paper made out to bearer, you can strip bonds at home with a pair of scissors: just clip off all of the remaining coupons, and sell them separately from the mantle, the piece that stands for the principal. On a larger scale, and especially when bonds are registered rather than bearer securities, stripping is done by buying coupon bonds, placing them into an incorporated mutual fund or a trust, and issuing separate claims against this portfolio, representing either the coupons or the principal.

The main consequence of stripping is that the principal can be sold separately, as a zero-coupon bond. One motivation for stripping is that immunisation and asset/liability management are simplified if there are zero-coupon instruments for many maturities. Also, zero-coupon bonds, offering capital gains rather than interest, get favorable tax treatment in many countries. In some countries, including Japan and Italy, capital gains are often partially exempt from personal taxation. Thus, the principal is sold to *e.g.* Japanese or Italian investors, and the (taxable) coupons are sold to low-tax investors.

Issuing procedures (1): the consortium Placement of eurobonds is most often through a syndicate of banks or security houses.

- The *book runner* (formerly called *lead bank* or *lead manager*) negotiates with the borrower, brings the syndicate together, makes a market (at least initially), and supports the price during and immediately after the selling period. Book runnership can be shared by a group.
- There are often, but not always, *managing banks* that underwrite the issue and often buy part of the bonds for their own account.
- The *placing agents* call their clients (institutional investors or individuals) and sell the bonds on a commission basis.

Just like in the case of bonds, there is creeping title inflation. More and more often the underwriters are called lead managers, and the term co-managers then refers to firms that just distribute the paper (the placing agents of old).

- The *fiscal agent* takes care of withholding taxes, while the *trustee bank* monitors the bond contract (if any such contract exists; most bonds are unsecured and do not have bonding clauses).

The various players get their commission through the discount they get when they buy the paper. In the table below we start from a set of commission percentages and then work out their implications for the prices at which the players buy and resell the bonds. The paper is assumed to have a nominal value of 10,000 per unit.

	% com- mission specs	the bank buys at	... and sells at	
lead manager	0.5%	9,750	9,800	(to underwriters)
underwriters	1.0%	9,800	9,900	(to selling agents)
sellers	1.0%	9,900	10,000	(to public or back to underwriters)

Prospective customers can find information about the issuing company and about the terms and conditions of the bond in a prospectus. Often, an unofficial version of the prospectus is already circulating before the actual prospectus is officially approved. This preliminary prospectus is called the *red herring* and is part of the *bookbuilding* stage, where the putative managing group is gauging the market's willingness to buy. Once the decision to issue has become final and the prospectus is official, investors can already buy forward the bonds in the few weeks before the actual issuing period starts. This period of unofficial trading is called the *gray-market period*.

The whole process typically takes up about a month or more—not exactly fast. For this reason, alternative issuing procedures have emerged:

Issuing procedures (2): alternatives to the consortium One rarer solution is the *bought deal*: a bank single-handedly buys the entire issue, before building a book and finding co-underwriters. This is riskier to the bank, so typically the implied underwriting fee is larger and/or the issue smaller—one always pays some price for speed.

Other alternatives entirely omit underwriting. In a *fixed-price reoffer*, the price to be paid by the public is set, and sellers get a commission if and when they place paper, say 0.15 percent. The borrower bears the risk that the whole issue flops, but since the procedure is faster than the traditional consortium method, the risk is thought to be bearable, by some. Still, one rarely sees such deals. In a *yield pricing* issue the price is set at the very end, taking into account yields of comparable bonds in the secondary market. The issuer agains buys speed, and there is far less risk that the paper is unsellable, relative to the case where the coupon is set weeks before the actual placement. But rates can still change after the selling starts, or the risk spread may not please the market, so there obviously is no certainty about quantity and price until the selling is over.

Another method is like the traditional *au robinet* (on tap) method, the way a bank traditionally issues its own retail CDs to the general public. This is best known as the *Medium-Term Note* (MTN) method even though it is now used for paper of 9 months to up to 30 years. Here, the borrower mandates a bank to sell paper within certain guidelines, say “money in the 1-5 year range at 50 basis points or

Figure 16.2: EBRD Ruble bond Issue

Nine banks underwrite new EBRD rouble bond
Rate on first quarterly coupon set at 5.56 percent

The EBRD has completed the placement of its second rouble bond, underwritten by a syndicate of nine international and Russian banks. The rate on the first coupon has been set at 5.56 percent.

This new 5-billion rouble (equivalent to €147 million) five-year floating rate instrument is being launched by the EBRD to meet the strong demand in Russia for the Bank's local currency loans. The EBRD raised its first rouble bond in May 2005 for exactly the same amount and with the same tenor.

The Russian subsidiaries of Citibank and Raiffeisenbank Austria are the Joint Lead Arrangers of the new issue – with JP Morgan Bank International, ABN Amro Bank AO, ING Bank (Eurasia) ZAO, Bank WestLB Vostok (ZAO) acting as senior co-lead managers. SAO Commerzbank(Eurasija) and Gazprombank are co-lead managers. Vneshtorgbank is the co-manager. ING will also act as the Calculation Agent for the issue.

The new EBRD bond's floating rate coupon is once again linked to MosPrime Rate, a money market index launched last year under the auspices of Russia's National Currency Association (NCA).

The MosPrime rate is calculated daily for 1-months, 2-months and 3-months deposits based on the quotes contributed by eight banks: ABN Amro, ZAO Citibank, Gazprombank, International Moscow Bank, Raiffeisenbank, Sberbank, Vneshtorgbank and WestLB.

The launch of the EBRD's second floating rate note underscores the development of the MosPrime Rate as a widely accepted money market benchmark in Russia since its launch in April 2005. Several public transactions have been linked to this index in the past year, the most recent, as well as the largest, being a 7.2 billion rouble (equivalent to €212 million) loan for Mosenergo.

The new issue was registered with the Federal Financial Markets Service (FFMS) on April 11. Just as with the first issue, the EBRD will apply for its bonds to be listed and traded on the Moscow Interbank Currency Exchange (MICEX) and for the Central Bank to include them in its Lombard list. This would make the bond available for repo transactions with the Central Bank.

The issue pays a quarterly coupon, with the coupon rate reset every three months in line with the then prevailing MosPrime offered rates. The coupon rate for the bond will be published at Reuters page EBRDRUBFRNRATE.

The EBRD enjoys an AAA/Aaa rating from international rating agencies.

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less over the relevant US T-bill rate”; and the mandatee simply waits for queries from big investors with excess liquidities. A deal like this can be made quite fast, occasionally even within one hour, and costs are quite low. One reason is that there is no official soliciting, no prospectus etc is needed. In addition, the intermediary is not guaranteeing anything. But obviously the issuer has no idea how long it will take to raise the sum they had in mind, and may have to improve the terms after a while. Still, this issuing procedure has become a serious alternative to the consortium system.

Secondary market The secondary market for eurobonds is not always very active. Many bonds are listed on the Luxembourg Bourse, but this is largely a matter of formality. A few hundred issues trade more or less actively on London's International Stock Exchange Automated Quotation (SEAQ International) computer system. Through SEAQ International, market makers post bid-and-ask prices for non-UK blue-chip stocks and for eurobonds. There is also an over-the-counter market, where (bored) bond dealers keep buying and selling to each other. Multilateral clearing institutions like Euroclear in Brussels, Clearstream (formerly Cedel) in Luxembourg, and the London Clearing House reduce the costs of physical delivery of the bond certificates themselves. (They also offer clearing services for trades of stocks listed on exchanges; Clearstream is now owned by Deutsche Börse.)

Figure 16.2 shows a press release by the European Bank of Reconstruction and Development on a Ruble bond issue.

Figure 16.3: A RUF: Kertih Terminals

Kertih Terminals Signs RM500 Million Financing Agreement For Bulk Chemical Storage Project

Kertih Terminals Sdn Bhd (KTSB) has signed an agreement with RHB Sakura Merchant Bankers Bhd as Arranger and Agent for a RM500 million Revolving Underwritten Facility (RUF) with Term Loan Conversion to finance the development of its centralised liquid bulk chemical storage and handling facility in Kertih, Terengganu. The financing agreement was signed today in Kuala Lumpur between KTSB, RHB Sakura Merchant Bankers and a group of financial institutions as underwriters and tender panel members of the RUF.

Under the agreement, KTSB, taking advantage of the prevailing favourable interest rates, will issue short-term negotiable debt instruments directly to investors during the first five years of the RUF, after which the facility is convertible into a four-year Term Loan. Additional features of the RUF, which has been assigned a short-term rating of MARC-1 by Malaysian Rating Corporation Bhd, include the option to raise fixed rate debts via conventional borrowings, structured debts (bonds) instruments or Islamic financing instruments.

KTSB, a joint venture between PETRONAS (40 percent), GATX Terminals (Pte) Ltd (30 percent) and Dialog Equity Sdn Bhd (30 percent), is undertaking the centralised chemical storage project which forms an integral part of the Kertih Integrated Petrochemical Complex (IPC) currently being developed by PETRONAS. Phase one of the storage project is at an advanced stage of construction. When fully operational, the facility will have 37 tanks with a total storage capacity of 403,358 cubic metres to cater to a host of users and customers at the Kertih IPC. These include Vinyl Chloride (Malaysia) Sdn Bhd, PETRONAS Ammonia Sdn Bhd, BP PETRONAS Acetyls Sdn Bhd, Aromatics Malaysia Sdn Bhd and the Union Carbide Corporation-PETRONAS' derivatives joint venture.

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Source <http://www.petronas.com.my/internet/corp/news.nsf/2b372bb45ff1ab3a48256b42002b19a7/a09ff4bcca787b048256adf0049a50f?OpenDocument>

Eurobonds represent the long end of the eurosecurities market. We now turn to markets for securities with shorter times to maturity.

16.2.3 Commercial Paper

Commercial paper refers to short-term securities (from seven days to a few years) issued by private companies. Just as bonds are the disintermediated version of long-term bank loans, commercial paper (CP) forms the disintermediated counterpart of short-term bank loans. CP markets have existed in an embryonic form ever since banks drew promissory notes on their borrowers as a way to document loan agreements. However, the market became important only in the eighties when, as part of the general disintermediation movement, large corporations with excellent credit standing started issuing short- and medium-term paper, which then was (and is) placed directly with institutional investors. The volume of the market remains low relative to the bond and bank-loan market.

The market consists of notes, promissory notes, and certificates of deposits (CD)s. *Notes* are medium-term paper with maturities from one to seven years, usually paying out coupons; many Europeans would simply call them bonds. *Promissory notes* have shorter lives (sometimes as short as seven days), and are issued on a discount basis, that is, without interim interest payments. Notes and promissory

notes issued by banks are called *certificates of deposit* (CDs).

Although an CP issue can be a one-time affair, many issuers have an CP-program contract with a syndicate. A bare-bones CP program simply eliminates the bother of getting a syndicate together each time commercial paper needs to be placed, but many programs also offer some form of underwriting commitment (for issues up to a given amount and within a given period). Such a commitment can stipulate the following terms:

A fixed spread An arrangement under which a borrower can issue CP at a fixed spread, e.g. 0.5 percent over LIBOR, is called a *Note Issuing Facility (NIF)*. This preset spread may become too high later on, notably if the borrower's rating improves or if the average spread in the market falls. In such cases, the borrower loses—he pays too much, in view of the changed circumstances—and the placing agent gains because he or she can place the paper above the initially anticipated price. In contrast, if the preset spread becomes too low, the borrower unambiguously wins; the cost is then born by the underwriter, who has to buy the issue at a price that exceeds the fair market value.

Figure 16.3 refers to a RUF extended to Malaysia's Kertih.

The difference between a NIF and a RUF is less important than what it may seem at first. Even a NIF is an option on a spread, not a forward contract on a spread, because the borrower is under no obligation to use the facility. That is, if spreads go down in the market, the borrower can simply forget about the NIF and issue paper through a new syndicate or under a new agreement. Under such circumstances, the advantage of the RUF to the borrower is that it avoids the cost and complications of setting up a new issuing program and, of course, that there is a cap on the risk spread.

16.3 How to Weigh your Borrowing Alternatives

Companies can get tentative offers from more than one bank or group of banks, or offers in many currencies. How to compare them?

One of this book's fundamental tenets is that, in a perfect market, everything is priced correctly, and nothing is gained nor lost by the mere switching from one borrowing alternative to another. NPV's on all financial transactions would be zero, in the sense that the PV of the future service flows is fully reflected in the price. Yet this does not mean that a real-world CEO can always relax and pick a loan at random from any first-coming bank. Let's review a few arguments that came up already in the preceding chapters, and add a few new ones. We group the relevant items under two headings: interactions with operational cash flows, and market imperfections.

Interactions with operations To a company, a financial contract may deliver more than the contract's very own cash flows; notably, as we saw in Chapter

12, the choice of the denomination of one's assets or liabilities may interact with the operational cash flows in wider sense, for instance, by affecting the probabilities of financial distress and the costs that come with it. If so, these interactions would affect the firm's market value.

Imperfections Many aspects of real-world markets could make the choice between borrowing alternatives relevant. Information asymmetries among lenders are likely to lead to inconsistent risk spreads across banks, for instance, or tax asymmetries may make high-interest or high-volatility currencies more attractive. An even more fundamental imperfection would be if prices in exchange and money market are fixed by the government and/or if a license *raj* prevents arbitrageurs and speculators to do their usual job: then even deals at the risk-free rate, assuming away any information or tax issues, are likely to come with non-zero NPV's. Non-zero NPV's could also arise from less glaring forms of market inefficiency, though, like herd behavior—anything that might lead to mispricing, which the astute speculator can then take advantage of. Lastly, there are the fees that banks charge, and the careful money manager has to check and re-check that the lenders are not trying to overcharge.

We start with the issues that should be the most likely cause of relevance in well-developed markets: costs and risk spreads. These are also easily quantified and summarized into one number. Having ranked the alternatives in terms of these items, we can then assess whether there is a good reason to deviate from that ranking. The easiest case is one where the home and foreign capital markets are both very open and developed. Agents can freely choose where to borrow, from whom and in what currency they want. There are, in addition, competitive swap markets where foreign-currency borrowing can be separated from borrowing abroad. In such a situation it is plausible that, if there were no default risk and no information asymmetries, little value would be gained or lost by switching to another currency—whether we do so explicitly or via a swap. In such a setting we can focus on just the costs asked by competing banks over and above the risk-free rate, that is, the items reflecting default risk and information asymmetries.

16.3.1 Comparing all-in Costs of Alternatives in Open, Developed Markets

Let's work via an example. The issuer is a US company that has a preference for USD borrowing; but there is a EUR offer too. The hoped-for proceeds would be USD 200m before costs, or, at the spot rate of USD/EUR 1.25, EUR 160m, and the CFO is going for a 7-year bullet loan. Table 16.4 shows the conditions, along with some other useful data and the computations. Please refer to them as the discussion proceeds.

Evaluation under Idealized Circumstances

We could look at the sum of discounted risk spreads and other costs, using the swap rate as the discount rate. This is similar to what we did in Chapters 5 (on forward contracts) and 7 (on swaps), except, trivially, that now we add an upfront cost. But there we took the swap dealer's point of view, whose risk is not the same as those born by a lender. So let's first bring a story that tells us why a procedure like this also makes sense, subject to a caveat, for lenders and borrowers without right of offset.

We regard a bond issue or a bank loan as an NPV problem. To the borrower, the proceeds are immediate, and the costs are the subsequent service flows—just the reverse of what one sees in capital budgeting, but that is not important. Let us denote the swap rate, a risk-free yield-at-par, by s ; the spread as asked by banker b over and above s by ρ_b ; and the required discount rate by R . Finally, let V_{nom} denote the gross size of the loan, and U_b the upfront cost proposed by banker b .

The NPV of accepting b 's proposal equals the net proceeds, $V_{nom} - U_b$, over and above the PV of the future service streams. We write this in line one, below. In line two, we just simplify and regroup, as follows:

$$\begin{aligned}
 NPV_b &= \underbrace{V_{nom} - U_b}_{\text{net IN}} - \underbrace{V_{nom} \times (1 + (s + \rho_b - R) \times a(R, \#years))}_{\text{PV of subsequent outflows}}, \\
 &= V_{nom} \times (s - R) \times a(R, \#years) - \underbrace{[U_b + V_{nom} \times \rho_b \times a(R, \#years)]}_{\text{the bank-specific part}} \quad (16.5)
 \end{aligned}$$

Offers may have been asked from various bankers, all for the same amount V_{nom} ; and s and R are market-wide numbers. Thus, the first part in the NPV expression, Equation [16.5], is common to all offers, and for that reason the competing offers from various banks can be ranked by looking just at the second part, the upfront cost plus the PV'ed spreads, labeled "bank-specific part" in the equation. The spread asked consists of the "objective" risk premium one would see in perfect markets, plus, in realistic bond markets, a compensation for the investors' unfamiliarity with the borrower: unknown parties look more risky. The investment bank, in the case of a bond issue, tries to reduce the unfamiliarity premium by road shows etc, but this increases U_b , the upfront cost. In addition, part of the bank's upfront expenses may be paid for not via the upfront fee U_b but by an extra interest spread instead; alternatively, as we have seen, the parties may agree to lower the very visible spread, and increase the less visible upfront fee U_b instead. That's why we should look at the whole package. Thus, we propose the PV criterion,

$$\text{PV'ed total bank-specific component} = U_b + V_{nom} \times \rho_b \times a(R, \#years). \quad (16.6)$$

This is what we did when we compared risk spreads in the Swaps chapter, except that we add the upfront cost and we use R not s . Using s was justified for a swap dealer, who benefits from the right of offset and the credit trigger. For a bank (or

the counterpart, the lender), the uncertainties are usually greater, so very often one needs to be a bit more careful about default risk.

How well do we know R , in reality?

This looks like a cut-and-dried problem. The only hitch is that R , the required rate of return, isn't easily observable. Only the Great Banker In The Sky knows it well. How come? Can't we just take the prior that the NPV is zero, which would allow us to infer R as the internal rate of return? In perfect markets, of course, NPV's from financial transactions must be zero. In reality we cannot bank on that, though, because acquisition of information is costly and time-consuming. This is especially an issue in the case of risky corporate borrowing, which is full of information asymmetries—either between banks and borrowers, or among the banks that might compete to act as lenders. Let's look at each of these asymmetries.

- If the financiers know more about the market situation than you do, chances are that they make a gain and you a loss. Not *all* bankers are angels. There is court evidence how investment bankers have underpriced the IPOs they managed, so as to be able to dole out goodies to friends and cronies. You may also have heard how derivatives dealers openly mailed each other about the “rip-off factors” they had included in their contracts, and how during the IT bubble investment bankers made fun of the “fools” they sold to.
- These are, of course, just anecdotes; but there exists a respectable academic literature on “hold-up” behavior. House bankers have a bit of a monopoly position, so the argument goes, since they have built up long-term knowledge about the borrower. Breaking up the relation would be costly for the borrower, since it takes time and effort for another bank to just re-discover all the info and insights the incumbent already has. Thus, the house bank is in a position to exact a monopoly rent—not too much, of course, otherwise they lose the account. Empirical evidence shows that banks actually do so.

For these reasons, mildly negative NPVs are far from unlikely. The borrower might still go along with a negative-NPV bond deal if, as pointed out, the loss is not large enough to justify changing banks or consortia and if the loss is small relative to the NPV of the direct investment that is being financed. In a way, the bankers just grab a slice of the firm's business gains. But the bottom line surely is that you cannot just postulate that competition is perfect, NPV's therefore zero, and R visible as the IRR of the deal.

Evaluation under Realistic Circumstances

Bearing all this in mind, let's now critically review two feasible methods and see how they relate to the ideal solution we just outlined.

Table 16.4: Appalachian Barracuda Corp’s Analysis of Funding Offers

1. The competing Offers

	(a)	(b)	(b)–(a)	upfront fee	7-year annuity factors	
	swap rate	loan rate	spread		at swap rate	at IRR
USD	4.50%	4.00%	0.50%	2.00%	6.002 054 67	5.819 282 33
EUR	4.35%	3.80%	0.55%	1.75%	6.046 667 84	5.860 778 76

spot rate USD/EUR 1.25

2. Comparing the loans via swap-rate-based PVs

USD loan:

risk spreads (PV)	$200m \times 0.005 \times \overbrace{6.00205467}^{a(7yrs, swap\$)} =$	USD	6,002,055
upfront	$200m \times 0.02 =$		4,000,000
total cost		USD	10,002,055

EUR loan:

risk spreads (PV)	$160m \times 0.0055 \times \overbrace{6.046667843}^{a(7yrs, swap€)} =$	EUR	5,321,068
upfront	$160m \times 0.0175 =$		2,800,000
total cost		EUR	8,121,068
id. in USD:	$8,121,068 \times 1.25 =$	USD	10,151,335

Extra cost of EUR = USD 10,151,335 – 10,002,055 = USD 0.149m

3. Comparing the loans via IRR-based PVs

USD loan:

YIELD("1/1/2001", "12/31/2007", $\overbrace{0.045}^{\text{coupon}}$, $\overbrace{98}^{V_t}$, $\overbrace{100}^{V_T}$, $\overbrace{1, 1}^{\text{don't ask}})$ =	%	4.844
swap rate	%	4.000
all-in spread	%	0.844
cost in USD: $200m \times [0.00844 \times \overbrace{5.81928233}^{a(7yrs, IRR\$)}] =$	USD	9.823m

EUR loan:

YIELD("1/1/2001", "12/31/2007", 0.0435, 98.25, 100, 1, 1) =	%	4.649
swap rate	%	3.800
all-in spread	%	0.849
cost in EUR: $160m \times [0.00849 \times \overbrace{5.86077876}^{a(7yrs, IRR€)}] =$	EUR	7.961m
cost in USD: $1.25 \times 7.961 =$	USD	9.951m

Extra cost of EUR loan = 9.951m – 9.823m = USD 0.128m

Key Method 1 computes the PV-ed spreads using the swap rate s and then adds the upfront. The resulting cost difference is USD 149K. Method 2 computes an internal rate of return (IRR)—I show the spreadsheet command that does it for you—and finds the IRR is 0.844% above the swap rate for the dollar loan, and 0.849% for the euro loan. The cost above the swap rate is then PV’ed at the IRRs.

1. **PV the spreads at the swap rate; add upfronts** This is close to our first criterion, Equation [16.5], except that we use the swap rate s instead of the risk-adjusted rate R . In defense of this method, remember that we do not want to value a given loan; rather, we want to rank two loans on the basis of the difference of the cost components, over and above the swap rates. Thus, first, we only discount the bank-specific part; so most of the service streams are not considered, which eliminates also most of the valuation errors created by using s instead of R . In fact, the PV of the spreads ρ_b is mostly affected by the size of ρ_b , in the numerator, not so much by the discount rate. Second, we make the same mistake for all loan alternatives, so that the net impact on the calculated cost differential is even smaller.
2. **Compute an IRR, subtract the swap rate, and pv the total cost at the IRR** The IRR, familiarly, is the stand-in discount rate that would equalize the discounted value of the future payments to the net value (after upfront costs). (This must be done numerically; the table shows a spreadsheet command that provides the answer.) So this method simply postulates that the deal's NPV in Equation [16.5] is zero, which, if true, allows you to compute an estimate of R . This allows us to estimate a total-cost spread that can be discounted at the IRR.

Assuming a zero NPV is not a crazy idea: in the absence of asymmetries it would actually be quite natural that both lender and borrower made a break-even deal. So this estimate of R must be close to the mark for big lenders with little information asymmetries. For smaller borrowers, negative NPV's are far more likely, in which case R is overestimated and the PV'ed cost underestimated.

Example 16.7

Think of the one-period case where we easily see what's going on. The swap rate is 8%. Suppose the fair value of a 10% loan is 100 but you are ripped off and get 99 only. The IRR would be $110/99-1 = 11.11\%$ while the true R is $110/100-1 = 10\%$. Using the IRR we'd estimate the cost at $(11.11-8)/1.11 = 2.799$ while the true figure is $2/1.1+1=2.818$.

The reassuring finding, in Table 16.4, is that the two measures of the differential cost are very similar. Using swap rates we'd reckon the cost difference between the USD and the EUR offers is USD 149K in favor of the HC offer, while the estimate is USD 128K when we use IRRs. The disagreement is 21K, a tiny number relative to the face value, USD 200,000K. Even more important, both methods agree that the HC loan, USD, has the lower costs.

A translated or equivalent spread for FC loans

In the above, I recommend that you size up the whole package in PV terms, an amount of cash money. Bankers and CFOs often look at percentages, though. Why

Table 16.5: Percentage total spreads of borrowing alternatives

	USD loan	EUR loan	difference
<i>Using swap rates</i>			
(a) PV'ed cost in USD	10.002	10.151	
(b) Eq. annuity: PV/6.002 054 67	1.666	1.691	
(c) id/200,000,000	0.833%	0.846%	0.012%
<i>Using IRRs</i>			
(a) PV'ed cost in USD	9.823	9.951	
(b) Eq. annuity: PV/5.819 229 22	1.688	1.710	
(c) id/200,000,000	0.844%	0.855%	0.011%
difference of % cost estimates	0.011%	0.009%	

PVSPVs instead? First, basic financial logic tells us to generally trust PVs, *i.e.* numbers in dollars or euros or pounds, not percentages: we pay for our shopping with money not percentages, and 1% extra on 1,000,000 means more money than 2% extra on 100. True, in this particular instance this is no issue since the alternatives, by design, all have the same scale, USD 200m, implying that there is no harm in looking at the percentages here. But there is a second reason why PVs, in units of money, are better than spreads: amounts of money are easily understood and easily compared across currencies. In contrast, to many business people it would be hard to see whether a spread of 0.75% on top of a swap rate of 8% is better or worse than a spread of 0.30% on top of a swap rate of 2%.

Despite all this, some traditional finance *babus* insist on percentage spreads. If your boss really presses you, here is how you could respond without giving up rigor.

The simple way to come to a *p.a.*-spread type number is to divide the HC PV numbers by the HC annuity factor, which means that we compute the equivalent annuity of all costs, upfront or not. Then we express the equivalent annuity as a percentage. Table 16.5 shows the results. Note how, by always using the same number —HC annuity factor times HC face value—to rescale the PV'ed costs we cannot possibly change the ranking of the alternatives. It is, in fact, easily shown that the FC costs are those of swapped FC loans, not of the original FC loans. Just hope that your boss does not raise the question; and if (s)he does, say that the numbers are adjusted for currency risk.

The calculations show, first, that the estimated total spreads are not very much affected by whether you use swap rates or IRRs: these intra-column differences, shown in the bottom line, amount to one basis point only. The second conclusion is that both methods agree that the EUR and USD offers are very close, with a disadvantage of slightly over one basis point for the EUR loan. These differentials across columns are shown in the rightmost column of the table.

Making a decision

If cost is the only consideration, then in this example the USD offer has the edge, but it is a very close race. What other considerations could have swayed the balance? Basically, anything that would imply a preference for EUR would do, given that costs are essentially the same.

One consideration that could interfere with this conclusion would be speculation, the way we defined it in earlier chapters. The calculations here would be very different: instead of comparing the USD loan to the swapped EUR loan we'd have to consider the unswapped version and see whether the difference of the IRRs is justified by the expected currency movements. In Table 16.4 the IRR of the unswapped EUR loan was found to be 4.65%, against 4.84% for the USD offer. So if the EUR appreciates by less than 0.2% per year, on average, then in terms of expectations it would be less expensive than dollar borrowing. Early 2008, many may feel that the Euro is actually overvalued and is expected to slide back to lower levels. If, in addition, the yield is lower, then we'd have an argument for EUR borrowing. This logic is very different from the cost-based calculations, where any discrepancy between the differential swap rates and the expected rate of appreciation is postulated to be rational—for instance, reflecting risk considerations.

Speculation is not the only argument that might affect the final decision. There may be EUR-related assets that need to be hedged anyway. Bear in mind, though, that the existence of foreign assets does not necessarily mean that these assets come with a positive exposure; remember the Android example in Chapter 13.

You will agree that weighing the speculative and hedging aspects is difficult, as neither is easily quantified. But things are even less satisfactory when the foreign currency under consideration lacks financial instruments like forwards and swaps or, even worse, the foreign money and exchange markets are plagued by controls.

16.3.2 Comparing all-in Costs of Alternatives in Regulated, Incomplete Markets

The alternative to the USD loan (200m, as before) now is a CNY one, as the investment now is in China. There are no long-term forwards or swaps. There is no liquid government-bond market, and if there were one there still is the problem that there are exchange controls. Neither Chinese investors nor foreigners can freely switch their funds from CNY to USD, so that one cannot just assume that Yuan and Dollar loans are correctly priced relative to each other in one international market.

The hoped-for proceeds of a possible Yuan loan, at the spot rate of CNY/USD 8.00 (this is a rounded number to simplify the figures), would be CNY 1.600m. The CFO is still going for a 7-year bullet loan. The terms offered are a loan at 6.75% and total upfront fee of 1 percent. To see whether this is good or bad, you could look at the bids and asks of the People's Bank, the market leader, as shown in

Table 16.6: People's Bank of China interest rates, late 2006

lending rate		savings rate	
		3 months	1.80%
6 months	5.58%	6 months	2.25%
6-12months	6.12%	1 year	2.52%
1-3 years	6.30%	2 years	3.06%
3-5 years	6.48%	3 years	3.69%
> 5 years	6.84%	5 years	4.14%

Table 16.6. The lending rates are, in fact, the People's Bank's reference rates. The central bank is, indeed, the entity that decides on reference interest rates for loans, but it also sets a band within which local bank branches have some discretion in adjusting their lending rates. As of 1999, the band is 10% below and 30% above the reference rate and for loans to large enterprises, the upper limit is 10% above the reference rate. According to Garca-Herrero et al. (2005), due to the banks' lack of expertise in assessing borrowers' credit risk, most loans are just contracted at, or even below, the PBC's reference rate despite the additional flexibility provided by the liberalization of interest rates.

An uncritical spreadsheet-adept could calculate that the borrowing rate for best-quality borrowers would be the rate at the bottom of the People's Bank admissible range, *i.e.* $6.84\% \times 0.90 = 6.156\%$. The corresponding risk spread would then be $6.75\% - 6.156\% = 0.594\%$. Below, then, are shown the calculations using that stand-in for the risk-free rate; the corresponding annuity factor is 5.551,560,664. I show the NPV and total-spread calculations:

Example 16.8 CNY alternative

risk spreads (PV)	$(1600 \times 0.00594 \times 5.551,560,664)/8.00 =$	USD 6,595,254
upfront	$1600 \times 0.01/8.00 =$	<u>2,000,000</u>
total cost		8,595,254
equivalent annuity	$8,595,254/5.551560664 =$	1,548,259
same, in percent	$1,548,259/200m =$	% 0.774
YIELD("1/1/2001", "12/31/2007", 0.0575, 99, 100, 1, 1)	$=$	% 6.935
risk-free proxy		% 6.156
all-in spread		% 0.779

So far so good—but what is the point of the calculations? We do not really have a risk-free rate: 6.156 is a possible lower bound that is, however, rarely applied. If we had worked with 6.5 as the risk-free proxy, the equivalent annuity would have been calculated as 0.25% above 6.5%, and the IRR at 0.435% above it, not 0.77-0.78%. We could even make a case for using the midpoint rate rather than a borrowing

rate. That midpoint rate would be 5.49, implying all-in spreads of 1.44%, as you can calculate.

DoItYourself problem 16.5

Do calculate the equivalent annuity part. (The IRR part is trivial, of course.)

As long as spreads are small and similar across countries, as in the USD-EUR case, these refinements hardly change the conclusions, but here we have a spread of 2.7 percent between bid and ask. We conclude that all calculations are, at best, tentative.

But lack of knowledge of the risk-free rate is not the only problem. Even if we had an active internal market for government bonds, the rate would still not be integrated with rates for other currencies, because worldwide financial investors cannot freely switch between CNY and USD lending (or borrowing, for that matter). The mechanism that normally equalizes the values and wipes out non-zero NPV's is missing, and along with that we lost all grounds to believe that the "risk-free" versions of the USD and CNY loans are truly equivalent. Remember that this last notion was the reason why only the PV'ed risk-spreads and costs need to be compared even for loans in different currencies. Conversely, without market integration the whole let's-just-compare-spreads approach is built on sand. Quicksand actually.

So all we can say is that, in terms of IRRs, USD borrowing would cost 4.84% while in CNY the figure is 6.94%. If the Yuan were expected to depreciate by about 2.0% per year, the two loans would be expected to have the same cost:

$$\begin{aligned} \text{break-even appreciation rate on FC, } a: \underbrace{(1+a)(1+R^*)}_{\substack{\text{total} \\ \text{return on} \\ \text{FC}}} &= \underbrace{(1+R)}_{\substack{\text{return} \\ \text{on HC}}}, \\ \Rightarrow a = \frac{1+R}{1+R^*} = \frac{1.0484}{1.0694} - 1 &= -\%1.96, \end{aligned}$$

In the case of the Yuan, at the time of writing the decision would be easy: the currency is undervalued by most standards; there is pressure from US Congress to revalue it, and the PBC seems to have chosen a course of slow and gentle appreciation. In short, the smart money would bet on an appreciation not depreciation of the Yuan against the US dollar. Given the extra 2% cost, there is no case for Yuan borrowing.

Of course, one is not always so lucky: with overvalued currencies (a policy often preferred by politicians in the past),¹² we'd have to weigh the cost of a high yield against the boon of expected depreciation. Signs of overvaluation would be a

¹²An overvalued home currency makes manufactured imports cheaper, which suits the city population and the political class; farmer exporters are hurt, but they often have less influence. An expensive currency rate also is regarded as adding prestige; devaluing would be an admission of defeat.

hamburger-parity rate far above those of comparable countries, or PPP rates that are unusually high; exchange controls; and interest-rate ceilings. But all this generates only hints and directions, not precise expected values. To make things worse, expectations are only part of the story: we should think of a normal risk premium too.

16.4 CFO's Summary

The main differences between international (“euro-”) and domestic transactions are that the former are often extra-territorial, and the market is a liquid and unregulated wholesale market. As a result, spreads and costs are quite low, and the international markets have become an increasingly important source of funding for medium-size or large corporations. Apart from this, the transactions one can make in these markets are not fundamentally different from the transactions in standard domestic markets: there are time deposits and term loans, credit lines, and markets for bonds and short-term paper.

A more recent instrument is the forward or futures contract on interest rates, which we discussed in the Appendices to Chapters 4 and 6. Remember, from that discussion, that interest rates (spot and forward interest rates, and “yields at par” are all linked by arbitrage. Forward interest rates in various currencies are likewise linked through the forward markets.

Comparing loans is easy when markets are well developed and free. In that case, differences between risk-free rates should reflect the market's opinion about the currency, and switching between risk-free FC and HC lending would not affect value. The CFO's focus should therefore be on upfront costs and risk spreads. Using swaps, one can separate the currency of effective borrowing from the currency of effective exposure—for instance by borrowing at home and swapping into FC. So the rule is *always* to borrow where it is cheap in terms of costs and spreads, whether you fancy the currency or not. You can change the denomination afterwards via a swap, if you want. Hedging of operational exposure could be a consideration in the decision whether or not to swap the cheapest loan into another money. So could speculation—but bear in mind that the records of exchange-rate forecasters are patchy.

With less well-developed markets, the absence of a clear and market-set risk-free rate makes decisions much more difficult. One can compute total costs, but one often cannot separate out a risk-free component; and if a locally-set risk-free rate proxy is available after all, it still is unlikely to reflect a currency's relative prospects as viewed by the international market. If currency and risk-free interest rates reflect some officials' opinion rather than the market's views, the usual prior that financial deals are zero-NPV transactions would not even hold as a first approximation.

A sensible general prior might be that, for reasonably respectable companies,

borrowing in developed markets should be more attractive, for the simple reason that sophisticated markets are cheaper to operate and its players better informed. Selectively subsidized loans in the host country could offset that, but the WTO frowns on practices like that. Interest rates that are capped without discrimination, in contrast, would be acceptable to the WTO, and still exist in some places. Another item that could tilt the balance back to the host-country market is the exchange rate. Controlled exchange rates often imply one-way bets: it is usually obvious whether the currency is overvalued or the converse. But remember that getting the timing and size of the adjustment right remains difficult. There is no easy way out, here. For decisions like this, CFOs will not be replaced by computers any time soon.

16.5 Test Your Understanding

16.5.1 Quiz Questions

The questions also cover interest forwards and futures, which were discussed in the appendix to Chapter 4.

True-False Questions

1. The abolition of the Interest Equalization Tax, Regulation Q, the cold war, and the US and UK foreign exchange controls have taken away most of the reasons why euromarkets exist. As a result, we can expect these markets to decline in the near future.
2. Without the US trade deficit, the euromarkets would have developed more slowly.
3. With a floating-rate loan, the bank is free to adjust the interest rate at every reset date in light of the customer's creditworthiness.
4. One of the tasks of the lead bank under a syndicated bank loan is to make a market, at least initially.
5. The purpose of using a paying agent is to reduce exchange risk.
6. Caps and floors are options on interest rates. Because interest rates are not prices of assets, one cannot price caps and floors using an option pricing model that is based on asset prices.
7. Because euroloans are unsecured, the spread over the risk-free rate is a very reliable indicator of the borrower's general creditworthiness.
8. FRAs are not really a good hedge against future interest rates because one does not actually make the deposit or take up the loan.
9. A note-issuing facility forces the borrowing company to borrow at a constant spread, while a revolving underwritten facility gives the borrower the benefit of decreasing spreads without the risk of increasing spreads.
10. The fact that eurobonds are bearer securities makes them less attractive to most investors.
11. Bond stripping is always done with a pair of scissors: you just clip off the coupons.
12. Disintermediation is the cause of the lower creditworthiness of banks, and has led to capital adequacy rules.
13. Ignoring the small effects of marking to market, the standard quote for a eurocurrency futures price is basically a forward price on a CD.

Multiple-Choice Questions

1. Eurocurrency and euroloan markets are attractive because:
 - (a) the spread between the buy and ask exchange rates is lower than in the interbank exchange market.
 - (b) the bid-ask spread between the lending and borrowing interest rates is lower.
 - (c) eurobanks are not subject to reserve requirements.
 - (d) eurobanks are not subject to capital adequacy rules (the so-called BIS rules).

2. Eurobanks borrow for short maturities and lend for longer maturities. They can reduce the interest risk by:
 - (a) extending fixed-rate loans.
 - (b) extending floating-rate loans.
 - (c) extending revolving loans.
 - (d) shorting forward forwards (that is, getting a forward contract on a loan, not on a deposit).
 - (e) shorting in FRAs.
 - (f) going long eurocurrency futures.
 - (g) buying forward the currency in question.

3. A cap on a floating-rate euroloan:
 - (a) protects the borrower against high short-term interest rates.
 - (b) protects the lender against high short-term interest rates on the funding side.
 - (c) is similar to a call option on short-term paper with the cap rate, as nominal rate; and the borrower is the holder of the call option.
 - (d) is similar to a put option on short-term paper with the cap rate, as nominal rate; and the borrower is the holder of the put option.
 - (e) is similar to a put option on short-term paper with the cap rate, as nominal rate; and the lender is the holder of the put option.

4. Which of each pair best describes eurobanking?
 - (a) retail/wholesale
 - (b) individual lender/bank consortium
 - (c) reserve requirements/limited or no reserve requirements
 - (d) unsecured/secured
 - (e) fixed-rate lending/floating-rate lending

- (f) foreign exchange markets/money markets
- (g) open to all companies/open to the better companies only

5. Matching Questions: Choose from the following list of terms to complete the sentences

below: paying agent, managing banks, trustee bank, placing agents, market, lead bank (or lead manager), participating banks, prospectus, gray market, fiscal agent, buy forward, underwrite, lead manager, red herring.

A consortium (or syndicate) that extends a euroloan consists of many banks that could play different functions. In a euroloan, the (a) negotiates with the borrower for tentative terms and conditions, obtains a mandate, and looks for banks to provide the money or undertake to provide the money if there is any shortfall in funds. The banks that provide the actual funding are called (b). Because at the time of the negotiations the funding is not yet arranged, the (c) often contacts a smaller number of (d) banks who (e) the loan, that is, guarantee to make up for the shortage of funds if there is any such shortfall. The (f), finally, is the bank that receives the service payments from the borrower and distributes them to the participating banks.

Placement of eurobonds is most often via a syndicate of banks or security houses. The lead bank or (g) negotiates with the borrower, brings the syndicate together, makes a (h) (at least initially), and supports the price during and immediately after the selling period. There are often, but not always, (i) that underwrite the issue and often buy part of the bonds for their own account. The (j) call their clients (institutional investors or individuals) and sell the bonds on a commission basis. The (k) takes care of withholding taxes, while the (l) monitors the bond contract. Prospective customers can find information about the issuing company and about the terms and conditions of the bond in the (m). Often an unofficial version of the prospectus is already circulating before the actual prospectus is officially approved; this preliminary prospectus is called the (n). On the basis of this document, investors can already (o) the bonds for a few weeks before the actual issuing period starts. This period of unofficial trading is called the (p) period.

16.5.2 Applications

1. You are an A-quality borrower, and you pay 10 percent on a five-year loan with one final amortization at the end and annual coupons. This is 1 percent above the spread paid by an AAA borrower. What will be the up-front fee for which your bank should be willing to lower the rate by 1 percent?
2. A bank offers you the following rates for a 5-year loan with annual coupons: 10 percent fixed, or (when you borrow floating-rate) LIBOR + 2 percent. You prefer to borrow floating-rate, as you expect a drop in interest rates. Another bank offers you LIBOR + 1.5 percent, but asks a substantial up-front fee. How can you compute which bank offers the better terms?

3. You bought an option that limits the interest rate on a future six-month loan to, at most, 10 percent *p.a.*
 - (a) If, at the beginning of the six-month period, the interest rate is 11 percent, what is the expiration value of this option?
 - (b) What is the option's expiration value if the interest rate turns out to be 8 percent?

4. You bought an option that limits the interest rate on a future six-month deposit to at least 10 percent *p.a.*
 - (a) If, at the beginning of the six-month period, the interest rate is 11 percent, what is the market value of this option?
 - (b) What is the option's value if the interest rate turns out to be 8 percent?