The Pricing of Syndicated Eurocurrency Credits

In recent years the syndicated Eurocurrency bank loan has become one of the most important instruments for international lending. These publicly announced loans have grown rapidly, totaling over $80 billion in 1979, and now comprise approximately half of all Eurocurrency credits. Syndicated credits are an important pillar in the recycling process whereby surpluses from oil-exporting countries (in the form of deposits) are channeled to oil-importing countries (in the form of loans) to finance their deficits.

The pricing of syndicated Eurocurrency credits is a subject of particular interest to banks and their supervisors. The loans are generally priced as a spread over the interbank interest rate in the Euromarkets. The interest rate paid by the borrower is adjusted every three or six months as market rates vary. Spreads for all borrowers have narrowed sharply from those prevailing in 1974-75, while maturities have lengthened. There are concerns that, at the rather narrow spreads currently prevailing (⅜ to 1½ percent, depending on the borrower), these loans may not yield an adequate return on bank capital after adjusting for risk and expenses. To the extent that this is true, the capacity of commercial banks to continue to play an important role in recycling could be impaired.

This article investigates the pricing of syndicated loans. It examines the factors which analytically should be important and empirically are important in determining the spread. The paper does not attempt to hypothesize whether the spreads are in some sense correct or reasonable; instead, it concentrates on the events and influences that have contributed to the currently narrow spreads.

An overview of the sydicated loan market

A syndicated credit is a loan in which a group of financial institutions makes funds available on common conditions to a borrower. This type of lending commonly occurs in both the Eurocurrency market and in the United States domestic market, although in the latter it is a bit less frequent and is done under slightly different institutional arrangements. In the domestic market, as a normal part of business practice, a corporation will usually have a banking relationship with a number of institutions. If the corporate borrower needs more funds than a single bank can or will provide, rather than opting for a syndication the borrower will often draw down its credit lines at other banks, sometimes at less favorable terms. By contrast, in the Eurocurrency market, if a given borrower needs a large amount of funds, a syndicate will usually be formed and all banks in the syndicate will participate in the loan on the same terms.

Growth and development of the market

The syndicated Eurocredit is a relatively new market development dating from the late 1960s Prior to this innovation, large Euromarket financings were all in the form of Eurobonds. Bank credits were, just as now, priced as a percentage over the interbank interest rate but were issued by a single bank. Hence, the size of the credits were constrained by the prudent lending limits of the bank. Using the syndication mechanism, credits of over $1 billion have been handled with relative ease.

Since its inception, the market has grown rapidly from $4.7 billion in 1970 to $82.8 billion in 1979 as

shown in the table. This twentyfold increase does not all represent new money being made available, since there were considerable refinancings in 1978 and 1979 when spreads narrowed. Nonetheless, the growth is impressive. Syndicated credits now provide somewhat more than half of the medium- and long-term borrowings in international capital markets. (Eurobonds and foreign bonds account for the rest.) However, they accounted for more than 85 percent of the medium- and long-term funds for developing countries and 98 percent for centrally planned economies in the 1973-79 period.

In the wake of successive oil price increases and the resulting balance-of-payments deficits for most nonoil-producing less developed countries (LDCs), the Eurocurrency market allows for recycling of funds to many governments that have little or no access to other international capital markets. The relative share of non-OPEC (Organization of Petroleum Exporting Countries) LDC borrowing follows very closely the pattern of aggregate current account deficits of these countries. Non-OPEC LDCs accounted for 21 percent of the market in 1972-73, rising to 39 percent in 1975, dropping to 32 percent by 1977, and rising again to 43 percent in 1979. The aggregate deficit for non-OPEC LDCs was approximately $7 billion in 1972-73, rising to $32 billion by 1975. As a result of the declining real price of oil, and the recovery of the developed countries from the 1974-75 recession, the aggregate deficit declined to $14 billion in 1977. But for 1979 the aggregate deficit is estimated at about $35 billion and is projected to go up to about $50 billion-$55 billion in 1980.

The Communist countries have also increased their commercial bank borrowing dramatically since 1972-73. The bulk of this borrowing has been done by East Germany, Hungary, and Poland. It was widely believed that the Soviet invasion in Afghanistan early this year would adversely affect the borrowing ability of the Communist countries. So far the evidence is inconclusive. Rumania and Hungary recently borrowed on terms which, taking into account market conditions, are no different from those they would have obtained in 1979. However, the volume of loans to Eastern bloc countries is much lower than in previous years.

Up until late 1979, OPEC countries were also active borrowers in the Eurocredit market. The bulk of the OPEC borrowing was done by the group of countries known as high absorbers, those with current account deficits and small current account surpluses. The low-absorbing group, consisting of the countries with the massive current account surpluses, namely, Saudi Arabia, Kuwait, Libya, Qatar, and the United Arab Emirates, do relatively little of the borrowing. OPEC borrowing is used primarily to finance energy-related and other development projects.

As the syndicated loan market has matured, it has become much less concentrated. While in 1970 the top ten borrowers accounted for 84 percent of total Eurocredits, by 1974 this figure had declined to 66 percent and by 1979 was only 54 percent (Chart 1).

Syndicated Eurocredits comprise only about half of Eurocurrency bank lending. The other 50 percent is lent by individual banks, is not publicized, and is contracted for a shorter maturity than its syndicated counterpart. These credits are primarily to the private sector for trade financing or internationally related business loans.

Why are syndications so prevalent in the Eurocurrency market?

Syndicated Eurocredits have emerged as a popular

New Syndicated Eurocurrency Bank Credits

In billions of dollars

Group	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	January-April 1980
Total	4.7	4.0	6 8	21 9	29 3	21.0	28 8	41.8	70 2	82 8	18 4
Industrialized countries	4 2	2 6	4 1	13.8	20 7	7.3	11 3	17 4	29 1	27 5	9 2
Non-OPEC LDCs	0 3	0 9	1 5	4.5	6 3	8 2	11 0	13 5	26 9	35.4	4 9
OPEC countries	0 1	0 4	0 9	2.8	1 1	2 9	4.0	7 5	10 4	12 6	3 1
Communist countries	0	0 1	0 3	0 8	1 2	2 6	2 5	3 4	3 8	7 3	0 8

Because of rounding, figures may not add to totals

Source. Morgan Guaranty Trust Company, *World Financial Markets.*

vehicle for international lending because they contain advantages from the point of view of both lenders and borrowers From the lenders viewpoint, the syndication procedure is a means for banks to diversify some of the unique risks that arise in international lending. In part, these risks reflect the heavy concentration of public-sector borrowers in the market. Information compiled by the World Bank since 1975 indicates that credits to the public sector comprise approximately 75 percent of the syndicated lending.

The legal protection available to a bank is much different if a private borrower defaults as opposed to the case in which a public borrower defaults If a private borrower defaults or otherwise fails to fulfill the obligations stipulated in the loan agreement, creditors can pursue various legal remedies. There is a considerable legal framework in each country to safeguard the claims of creditors if a borrower has declared bankruptcy When commercial banks lend to public-sector borrowers, there is much more uncertainty about legal recourse. For instance, there are questions about which public-sector borrowers are covered by sovereign immunity.

There also are special political uncertainties, including the risk, however remote, that a public-sector borrower will choose not to repay loans from individual banks or a group of banks in a particular country. The syndication process tends to magnify the penalty associated with selective defaults. In the case of a widely syndicated loan from banks in several nations, unwillingness to repay debts could effectively preclude the borrower from entering the credit market in the future It would be surprising if a lender in the earlier syndicate would be willing to participate and other lenders would be reluctant In addition, unwillingness to repay debts would bring political pressure from several countries as opposed to only one or two.

In addition to developing syndication procedures, banks have taken other steps to protect themselves against these risks For example, the risk of selective default on credits encourages banks to include a cross-default clause in the loan agreement. This clause states that, if one public borrower from a country defaults, the loans of other public borrowers from that country may be called into default as well. In that case, the loans of those borrowers become due and payable.

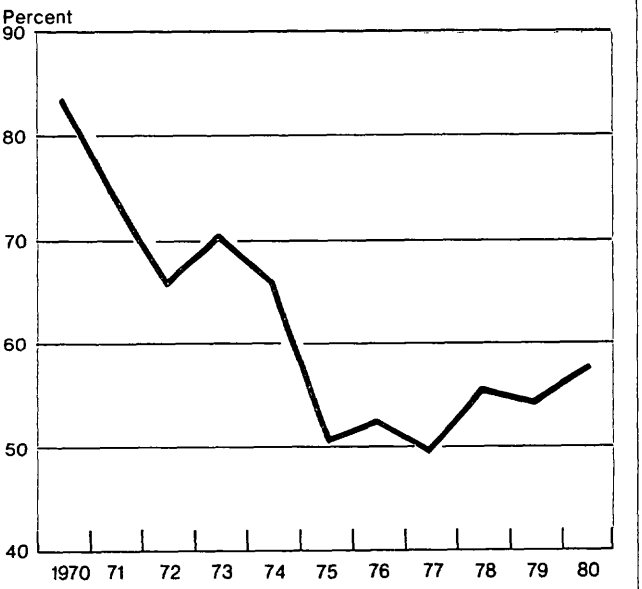
To recapitulate, syndication of public credits allows banks to reduce risk in two ways. First, it allows banks to diversify their loans to the public sector, which is more essential than with loans to the private sector due to the banks' lack of control over and protection against default by sovereign entities. Second, it provides more protection against selective defaults.

The syndication procedure is advantageous from the lenders' viewpoint as it allows different-sized banks to function in the market simultaneously. That is because a Eurocurrency loan is underwritten by a small group of banks who resell portions of the loan to other banks. The larger banks can underwrite a loan and earn underwriting fees. Smaller banks can simply purchase participations from the underwriting banks.

From the borrowers' viewpoint, syndication allows for the efficient arrangement of a larger amount of funds than any single lender can feasibly supply. This factor is crucial in explaining the popularity of shared credits in both the domestic market and the Eurocurrency market In the latter, however, syndicated lending becomes less of a convenience and more of a necessity. The financing needs imposed by the recycling process, coupled with the lack of alternative financing arrangements in the Eurocurrency market, create the demand on the part of borrowers for huge bank loans. In the United States domestic market, if a business needs a large amount of long-term funding, bank loans are only one, albeit often the most viable, of several options. The firm may also arrange for debt or equity financing. In external markets, however, there are fewer options. Industrial country borrowers,

Chart 1

Percentage of Syndicated Eurocredit Market Captured by the Top Ten Borrowers



Source Morgan Guaranty Trust Company, World Financial Markets

both governmental and private, may have access to the international bond markets, but LDC borrowers by and large do not. The only alternative source of financing for the latter group is the syndicated Eurocredit market.

The underwriting procedure used in the syndication of Eurocurrency credits may allow the borrower to obtain better terms than those that would otherwise be available. The syndicated credit is essentially a hybrid instrument, a cross between traditional bank lending and the underwriting function of investment banking By underwriting, major banks show their confidence in the credit, thereby making it more attractive to smaller financial institutions This blending of the investment banking and commercial banking functions is prohibited in many national markets including the United States, Japan, and Italy. In recent years, however, there has been some blurring of these activities in the United States. There are several examples of commercial banking practices which are not strictly speaking underwriting activities but which involve syndication procedures Moreover, municipal debt is often underwritten by commercial banks. In the London market, where a majority of the Eurocurrency syndications are arranged, underwriting is standard for both commercial banks and their merchant banking affiliates. These affiliates operate much like investment banks in the United States.

The syndication procedure[1]

There are generally three levels of banks in a syndicate: the lead banks, the managing banks, and the participating banks.[2] Most loans are led by one or two major banks who negotiate to obtain a mandate to raise funds from the borrower. Often a potential borrower will set a competitive bidding procedure to determine which lead bank or banks will receive the mandate to organize the loan.

After the preliminary stages of negotiation with a borrower, the lead bank will begin to assemble a management group to underwrite the loan The management group may be in place before the mandate is received, or may be assembled immediately afterward, depending on the loan. The lead bank is normally expected to underwrite a share at least as large as that of any other lender. If the loan cannot be underwritten on the initial terms, it must be renegotiated or the lead bank must be willing to take a larger share into its own portfolio than originally planned.

Once the management group is firmly in place and the lead bank has received a mandate from the borrower, a placement memorandum will be prepared by the lead bank and the loan will be marketed to other banks who may be interested in taking up shares (the participating banks). This placement memorandum describes the transaction and provides information about the borrower. The statistical information regarding the financial health of the borrower given in the memorandum is generally provided by the borrower. The placement memorandum emphasizes that reading it is not a substitute for an independent credit review by the participating banks. Bank supervisory authorities normally require sufficient lending information to be lodged in the bank to allow bank management to make a reasonable appraisal of the credit.

In a successful syndication, once the marketing to interested participants is completed, the lead and managing banks will keep 50 to 70 percent of their initial underwriting share.

Not all credits are sold to participants. In smaller credits to frequent borrowers, club loans are often arranged. In a club loan the lead bank and managers fund the entire loan and no placement memorandum is required. This type of credit is most common in periods of market uncertainty when all but the largest multinational banks are reluctant to do business.

It takes anywhere from fifteen days to three months to arrange a syndication, with six weeks considered the norm. Generally speaking, the more familiar the borrower, the more quickly the terms can be set and the placement memorandum prepared; the smaller the credit, the shorter is the time needed for negotiating and marketing.

After the loan is arranged, one of the banks serves as agent to compute the appropriate interest rate charges, to receive service payments, to disburse these to individual participants, and to inform them if there are any problems with the loan. The lead bank usually serves as agent, but another member of the management group may do so.

The most common type of syndicated loan is a term loan in which the funds can be drawn down by the borrower within a specified period of time after the loan agreement has been signed (the drawdown period). The loan is usually repaid according to an amortization schedule, which varies from loan to loan. For some loans it may begin as soon as the loan is drawn down. For other loans, amortization may not begin until as long as five years after the loan agreement has been signed. The period before repayment of principal begins is known as the grace period. This is one of the most

[1] A more detailed description of the syndication procedure can be found in an article by Henry Terrell and Michael G Martinson, "Market Practices in Syndicated Bank Euro-currency Lending", *Bankers Magazine* (November 1978)

[2] In some of the larger credits, there are four or more levels of banks the lead banks, the co-managers, the managing banks, and one or more levels of participating banks The co-managing banks underwrite more than a prespecified amount of funds

important points of negotiation between a borrower and a lead bank, and borrowers are normally willing to pay a wider spread in order to obtain a longer grace period.

Another type of loan less frequently used is a revolving credit. The borrower is given a line of credit which can be drawn down and repaid with more flexibility than the term loan. The borrower must pay a fee for the undrawn portion of the credit line.

The vast majority of syndicated credits are denominated in dollars, but loans in German marks, Swiss francs, Japanese yen, and other currencies are also available

The pricing of syndicated loans

Interest on syndicated loans is usually computed by adding a spread to the London interbank offer rate (LIBOR). LIBOR is the rate at which banks lend funds to other banks operating in the Euromarket Occasionally, however, a loan may be priced as a spread over the United States prime rate. Less frequently, pricing is done both as a percentage over LIBOR and over the United States prime rate, the banks have the option to shift from LIBOR to prime pricing at their discretion Pricing over the United States prime rate occurs when the syndicate is comprised primarily of United States banks who prefer to book the loan out of their head office rather than at an offshore branch. Strictly speaking, dollar loans booked in the United States are not Eurocurrency loans. However, these loans may be organized by offshore merchant bank subsidiaries.

The spread is negotiated with the borrower at the outset and either remains constant over the life of the loan or changes after a set number of years.[3] For example, a fifteen-year loan was recently syndicated at a spread of 3/8 percent over LIBOR for the first five years, 1/2 percent for the next five years, and 5/8 percent for the last five years. Loans priced over the United States prime rate generally carry a spread of 1/8 to 1/4 percent less than loans priced over LIBOR.

[3] An innovation in the pricing of syndicated credits has recently surfaced a loan with a floating spread This novel mechanism is being tested for a relatively small loan For the first year the spread was set at 7/8 percent over LIBOR, but after the first year the floating concept takes over Each year the banks in the syndicate will quote a spread based on their assessment of what the market would require of the borrower if it was to seek a loan for the amount and maturity outstanding The actual spread will be a weighted average of the quotes, with a maximum of 1 3/8 percent and a minimum of 5/8 percent If the borrower objects to the spread quoted by the banks, he has the option of repaying the loan without notice

This floating rate spread has advantages for both borrower and lenders The borrower will benefit because each requote will be for a shorter maturity, that is, seven years in twelve months, six years in twenty-four months, *etc* Lenders, on the other hand, can adjust the spread if the creditworthiness of the borrower changes In addition, the lenders will be in a position to take advantage of any widening of spreads that may occur in the market

The LIBOR is changing continuously However, the rate on any particular loan is readjusted only every three or six months This is known as pricing on a rollover basis. The borrower is usually given the choice between a three-month or a six-month readjustment period A six-month period is normally selected because in a period of generally rising interest rates, as had been the case until recently, it is desirable for a borrower to lock in rates for as long a period as possible. The new base rate is calculated two days prior to the rollover date as the average of the offer rates of several reference banks in the syndicate. The reference banks are carefully specified in the loan agreement

The spread above the LIBOR paid by the borrower understates the bank's actual return on a loan. The LIBOR is generally 1/8 to 1/4 percent above the rate at which banks purchase funds from large depositors (the bid rate). The London interbank bid (LIBB) rate is roughly equal to the interest rate on certificates of deposit (CDs) in the United States domestic market, adjusted for reserve requirements. In some situations the bid rate may even exaggerate the cost of funds to Eurobanks. The main example of this occurs when a single depositor (or group of closely related depositors) already hold significant funds in the bank and would like to deposit more.

Other fees

In addition to the interest costs on a Eurocurrency loan, there are also commitment fees, front-end fees, and occasionally an annual agent's fee. Commitment fees are charged to the borrower as a percentage of the undrawn portion of the credit and are typically 1/2 percent annually, imposed on both term loans and revolving credits. Front-end management fees are one-time charges negotiated in advance and imposed when the loan agreement is signed. Fees are usually in the range of 1/2 to 1 percent of the value of the loan[4] These front-end fees include participation fees and management fees The participation fees are divided among all banks in relation to their share of the loan The management fees are divided between the underwriting banks and the lead bank.[5] The agent's fee, if applicable, is usually a yearly charge but may occasionally be paid at the outset. These fees are relatively small; the agent's fee on a large credit may run $10,000 per annum.

To protect their margins, banks require all payments of principal and interest to be made after taxes im-

[4] Borrowers are sometimes willing to pay higher fees in return for a lower spread on the loan

[5] See Terrell and Martinson, *loc cit*, for a more complete description of the method by which the front-end fees are divided among the financial institutions

posed in the borrower's country have been paid. If those taxes are not creditable against the banks' home country taxes, the borrower must adjust his payments so that the banks receive the same net repayment. The decision as to whether the borrower or lender absorbs any additional taxes imposed by the country in which the loan is booked is negotiated between the parties.

Also, usually inserted is a reserve requirement clause, stipulating that an adjustment will be made if the cost of funds increases because reserve requirements are imposed or increased. This clause was invoked for loans booked in the home office of United States banks when marginal reserve requirements were imposed in late 1979.

There is generally no prepayment penalty on Eurocredits. In 1978 and 1979 when spreads narrowed, many borrowers chose to refinance the loans initially obtained in 1975 and 1976 at a higher spread. Banks then tried to impose prepayment penalty clauses on new loans, but borrowers were reluctant to go along with these. At least for the moment, banks have backed off because prepayment penalties have little relevance in a period of low spreads.

The charges on syndicated loans may be summarized as follows:

Annual payments = (LIBOR + spread) × amount of loan drawn + (Commitment fee) × amount of loan undrawn + tax adjustment (if any) + Annual agent's fee (if any)

Front-end charges = participation fee × face amount of loan + management fee × face amount of loan + initial agent's fee (if any)

Front-end changes are an important component of the banks' total return on a credit Consider a $100 million seven-year credit with no grace period If the loan is priced at 100 basis points over a LIBOR of 10 percent, annual payments of interest and principal repayment total slightly over $21 million. A 1 percent fee requires that $1 million be paid to the banks in the syndicate at the outset. This raises the effective interest to the borrower from 11 percent to 11.31 percent per annum If banks' paid, on average, 9 75 percent for their funds, the front-end fees increase their margin on the loan from 125 basis points to 156 basis points. This represents a 25 percent increment to their return on a credit.

Trends in spreads and maturities

The history of syndicated credits may be divided into four periods, two "borrowers markets" and two "lenders markets" depending on terms and conditions. During borrowers markets, spreads were low and maturities were long—attractive terms from the point of view of the borrowers During lenders markets, the situation was reversed.

- Lenders market, 1970 to late 1972
- Borrowers market, late 1972 to mid-1974
- Lenders market, mid-1974 to mid-1977
- Borrowers market, mid-1977 to present.

This division is depicted in Chart 2 where a time series for spreads and maturities from 1972 through the third quarter of 1979 is shown for the four major groups of borrowers· industrialized, OPEC low absorbers, high-income developing, and low-income developing.[6] Information on loans syndicated prior to 1972 are not available on a basis consistent with later data.

The lenders market from 1970 through late 1972 is best characterized as a period of market development. Spreads remained relatively constant during 1970 and 1971, and many borrowers entered the market for the first time

By mid-1972, lenders had developed confidence in the market, credit volume rose, spreads began to narrow, and maturities lengthened Bullet loans—credits in which there is no amortization over the life of the loan and the principal is entirely repaid at maturity—made their debut in the market during this period. This borrowers market continued until the Herstatt collapse in June 1974 The market bottomed out in mid- to late 1973. In the third quarter of 1973, weighted average spreads for the industrialized and high-income developing countries were 0 68 and 0.93 percent, respectively, coupled with maturities of nine and eleven and a half years After the quadrupling of oil prices, there was a small but perceptible tightening of terms, as loan demand outstripped the supply of funds at the record low spreads. Even so, by the summer of 1974, spreads were low and maturities were averaging about eight and a half years

All this changed, however, after the failure of Bankhaus Herstatt and the subsequent demise of Franklin

[6] This classification scheme is similar to the one used by the World Bank High-income developing countries are those the World Bank classified as high, upper, and intermediate middle developing at the end of 1978 Low-income developing countries are those the World Bank classified as lower middle developing as well as lower developing at end-1978 Industrialized and oil-exporting countries correspond to the World Bank group with those titles

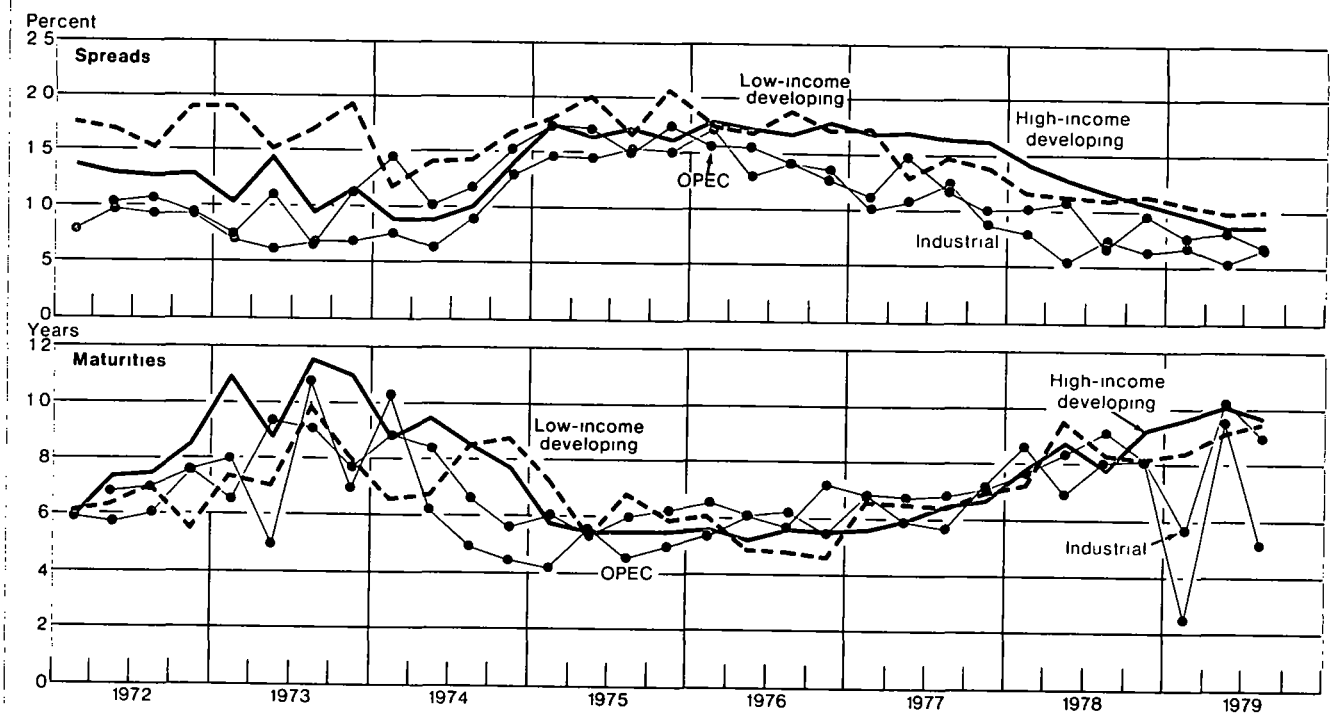
National Bank Depositors reacted by seeking to hold only very short-term funds in the safest and largest banks Responding to this sudden shift in depositors' attitudes, banks sought to shorten the maturity of their lending They were unwilling to commit themselves to long-term loans at prevailing spreads The result was a sharp tightening of lending terms; the weighted average spreads for industrialized countries doubled from 63 basis points in the second quarter of 1974 to 129 basis points in the fourth quarter. The deterioration in terms for the OPEC borrowers and the developing countries was equally dramatic.

In 1975, spreads widened further to the 1½ to 2 percent range and maturities dropped to about five and a half years Very few new loans with a maturity longer than eight years were agreed to by lending institutions. This lenders market lasted until mid-1977 At that point, confidence in the market began to strengthen as a result of the banking system's successful role in the recycling process. In addition, German and Japanese banks entered the syndicated market on a large scale, vigorously soliciting business. Hence, spreads began to narrow The weighted average spread for industrialized countries dropped from 1.25 percent in the third quarter of 1977 to 0 79 percent in the first quarter of 1978. Spreads for the developing countries fell correspondingly By the fourth quarter of 1977, average maturities had lengthened to nearly seven years

The borrowers market which began in mid-1977 is still present. In 1978 and the first three quarters of 1979, maturities rose and spreads narrowed further By the third quarter of 1979, spreads for high-income developing countries reached a record low of 0.86 percent But, in the wake of the freeze on Iranian assets in November 1979 and the series of oil price increases in late 1979 and 1980, market perceptions of risk have been altered and a two-layered market has developed In this period of market uncertainty as reflected in the slowing of new syndication activity, prime borrowers continue to borrow on terms not dissimilar to what they were receiving late last year (spreads of ⅜ to ⅝ percent) Other borrowers are, however, confronted with

Chart 2

Spreads and Maturities on Syndicated Loans



Source World Bank, Borrowing in International Capital Markets

somewhat higher spreads and lower maturities than in mid-1979.[7]

Determinants of spreads

There are several basic questions that consistently appear in any analysis of spreads.

- What causes a borrowers market or a lenders market?
- How are interest rates, spreads, and maturities related?
- What are the systematic differences in spreads between groups of countries?

This section considers certain economic factors which are important in the determination of spreads for syndicated Eurocredits: the level of interest rates, the volatility of interest rates, maturity, and risk. There are, however, other important factors which are difficult to quantify, such as increased competition from German and Japanese banks and relative loan demand pressures at home. These supply side influences were not explicitly included in the statistical analysis.

Level of interest rates

Narrow spreads are associated with a high level of interest rates for two reasons The first reason is that banks would be expected to equate the marginal cost of all sources of funds. In periods of high nominal interest rates, the opportunity cost of reserve requirements is higher. Hence, the absolute differential between Euromarket and domestic market interest rates will widen because the former has no reserve requirements. Thus, more funds will be shifted into the Euromarket and, with an unchanged demand for funds, this would be sufficient to reduce spreads.

The second reason that a high level of nominal interest rates implies a narrower absolute spread relates to the return on capital. A bank should be concerned about the consolidated return on capital. It can be shown that, when LIBOR rises, the rate of return on capital increases. Thus, if the cost of capital remains constant, spreads will be lowered to maintain the same rate of return on capital. The rate of return on capital is computed by assuming the loan is funded proportionately by capital and borrowed funds. Thus, if we hypothesize a capital/total assets ratio of 5 percent, this implies that the average loan is funded 95 percent from deposits and 5 percent from capital. Assuming the bank has no overhead or loan-processing costs and it purchases funds in the interbank market at LIBOR, the return on capital is derived as follows:

$$\begin{aligned}\text{Return on capital} = [&\text{return on the loan} - \\ &(\text{the cost of deposits}) \times \\ &(\text{deposits/assets})] \\ &\times \text{assets/capital}\end{aligned}$$

All terms are expressed in percentage per annum. If the capital/asset ratio is 0.05, the spread is 1 percent and the LIBOR is 16 percent, we have:

$$\begin{aligned}\text{Rate of return on capital} &= [\text{LIBOR} + 1 - \\ &\quad (0.95 \times \text{LIBOR})] \times 20 \\ &= 1.8 \times 20 = 36\end{aligned}$$

Assuming a marginal tax rate of, say, 50 percent, this 36 percent pretax rate of return is equivalent to an aftertax rate of return of 18 percent. If the capital/asset ratio and spread remain constant, and the LIBOR increases to 20 percent, the before-tax rate of return is now 40 percent and the aftertax rate of return is 20 percent. If the bank wished to achieve an 18 percent aftertax return on capital with a LIBOR of 20 percent, it would charge a spread of 80 basis points.

Since both effects work in the same direction, in theory higher interest rates should be associated unambiguously with lower spreads. Empirical work, shown in the appendix, confirms the theoretical hypothesis. Each 100 basis point (or 1 percentage point) increase in the level of rates over the relevant range will, all other things being equal, narrow spreads by 7 basis points.

Variation of interest rates

The more volatile are interest rates, the larger should be the spreads on Eurocurrency loans because banks do not eliminate interest rate risk by perfectly matching assets and liabilities. Since liabilities on average have shorter maturity than the rollover period for assets, the bank may have to fund the assets for the remainder of the rollover period with more expensive money than anticipated. The evidence indicates that this is important. Bank of England data for November 1979 show that 23 percent of foreign currency liabilities

[7] Another factor contributing to the slight tightening of terms for some borrowers is the freeze and slowdown of Japanese bank participation in the market In October 1979 the Japanese Ministry of Finance effectively banned Japanese participation in syndicated credit until April 1980 They were able to reenter the market in April, but they are limited to an estimated $5 billion in credits for April 1980-March 1981, only a small fraction of their participation in the first nine months of 1979 Since the market is relatively competitive, there have been enough non-Japanese banks willing to participate in syndicates so that this has had little influence on the spreads of most borrowers However, because of internally imposed country exposure limits, the slowdown of lending by Japanese banks has had an adverse effect on the spread for some heavy borrowers

Risk Protection Features of Syndicated Eurocredits

One of the most interesting features of a syndicated Eurocurrency loan is the degree it is tailored to minimize the risks that financial institutions participating in this market would otherwise face. Compared with the fixed rate credit arranged by an individual bank, the rollover syndicated Eurocredit reduces risk in several notable ways, as summarized below

Lending Risks

Risk	Source of risk	Risk reduction strategy
Country risk	The ability and willingness of borrowers within a country to meet their obligations	Syndication of the credit and diversification of bank's loan portfolio
Credit risk	The ability of an entity to repay its debts	Syndication of the credit and diversification of bank's loan portfolio
Interest risk	Mismatched maturities coupled with unpredictable movements in interest rates	Matching assets to liabilities by pricing credits on a rollover basis
Regulatory risk	Imposition of reserve requirements or taxes on the banks	A clause in the contract which forces the borrowers to bear this risk

of banks in the United Kingdom (including a number of United States bank and other Euromarket participants) was for eight days or less, 19 percent between eight days and one month, and 28 percent between one and three months. Thus, the vast majority of the liabilities which fund these loans are of a shorter maturity than the rollover period for the loans themselves. A bank will tend to demand a risk premium for incurring this interest rate risk.

Empirical work supports this supposition Each 0.01 increase in the quarterly coefficient of variation (the standard deviation as computed from daily figures, divided by the mean) translates into a 3 basis point increase in spreads.

Maturity

The relationship between maturity and spread depends on whether one is examining individual loan data at a single point in time or aggregate data across time. In a cross-sectional analysis, which examines individual loan data at a single point in time, there should be a positive relationship between the two variables. With other factors constant, a longer maturity loan should carry a wider spread in order to leave the lenders indifferent. This is true because, if spreads widen, lenders are locked into a long maturity loan at the old spreads. If spreads narrow, the borrower can refinance. In addition, bankers attempt to analyze both the economic and political risks associated with a loan. It is more difficult to analyze the economic and political risks over a twelve-year horizon than over a five-year horizon Thus, for each additional year of maturity, lenders will require compensation in terms of spread, fees, or grace period. Borrowers also prefer longer maturities and are willing to compensate lenders for such a loan because they are assured of the availability of funds at a prespecified spread, even if market conditions tighten. If market conditions loosen, a borrower can often refinance.

However, by averaging spreads and maturities for each risk group in each quarter, the trade-off on an individual loan is not visible. At any point in time, a lender might be willing to make a six-year loan to the borrowers of a certain risk class at 5/8 percent, an eight-year loan at 3/4 percent, or a ten-year loan at 7/8 percent If equal numbers of borrowers opted for each maturity, in the aggregate we would simply observe an eight-year loan at 3/4 percent.

Looking at aggregate data on spreads and maturities over time, as this article has done, there should be an inverse relationship between the two variables as maturity will serve as a proxy for market confidence During periods of low confidence in the market, spreads should be wide and maturities short. For example, in the two years following Herstatt, banks were worried about the continued availability of funds This was reflected in wide spreads and low maturities.

In fact, it was found that each one-year increase in maturity is associated with a 9 basis point decline in spread.

Risk

The higher the perceived risk associated with a borrower, the greater the debt service difficulties anticipated by the lenders, hence the wider the spread that would be required Thus, low-absorbing OPEC borrowers would be expected to pay a bit more than industrialized countries, high-income developing countries would be expected to pay more for borrowings than OPEC borrowers, and low-income developing countries would be expected to pay more than high-income developing countries. The data seem to bear this out. Holding other factors constant, OPEC countries borrow at 15 basis points more than industrialized borrowers, high-income developing countries at 38 basis points more, and low-income developing countries at 48 basis points more.

Risk premiums may be related to maturity. Since there is less certainty about the economic and political state of a given economy ten years from now, as opposed to next year, a risk-averse bank may charge a maturity-related risk premium to less than prime customers It was found that for high-income developing countries each additional year adds to the spread 5 basis points over what an industrialized country would pay. Thus, on a seven-year loan, a high-income developing country would pay 35 basis points more than an industrialized country. For low-income developing countries, each additional year adds to the spread 7 basis points over what an industrialized country would pay. Thus, for a seven-year loan, a low-income developing country would pay almost 50 basis points more than an industrialized country. For OPEC countries, each additional year adds 2 basis points or about 15 points on a seven-year loan

The perceived risk of lending to nonoil LDCs declined during 1975-79, as reflected in the spread differential between industrialized countries and nonoil LDCs. The large OPEC surplus in 1974 evaporated more rapidly than even the optimists in the market had predicted, and nonoil LDC deficits declined sharply in real terms from their 1975 peak of $32 billion. In addition, a number of nonoil LDCs—major borrowers like Korea and Brazil, for example—have developed their export potential rapidly. However, with the renewed widening of the OPEC surplus, the corresponding deficits for the LDCs are likely to be larger and more long lasting than had been thought. This is leading to a reassessment of relative risk

Summary and Outlook

This article has attempted to explore the factors which are theoretically and empirically important in the pricing of syndicated loans. It was found that, if the level of interest rates increases, the volatility of rates declines, or, if the maturities on loans lengthen, then the spreads on syndicated loans tend to narrow. Banks clearly recognize risk differentials between borrowers. Those from OPEC countries borrow at about 15 basis points more than those from industrialized countries. Those from high-income developing and low-income developing countries pay a risk premium of nearly 40 and 50 basis points, respectively

Thus far in 1980 there has been a slight tightening of terms for many borrowers With the United States moving into a recession, interest rates have fallen This has caused spreads to widen. The October 1979 decision of the Federal Reserve to place greater emphasis on bank reserves in day-to-day operations and less emphasis on short-term movements in the Federal funds rate resulted in wider interest rate swings. This increased rate volatility has been reflected in wider spreads Maturities have dropped as well, demonstrating concern on the part of some lenders about the effects on the banking system of another round of large-scale deficit financing

In the next two or three quarters, spreads on loans to a number of LDC borrowers could widen considerably more than spreads for industrialized borrowers. Nonoil LDCs already have a large amount of debt which must be serviced, as the outstanding debt of developing countries has more than doubled since 1974 Furthermore, this debt is concentrated in the largest United States and foreign banks, some of which are reviewing lending limits for certain borrowers Consequently, banks may be more hesitant to participate in large new syndications unless lending margins widen

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Appendix: Spreads

It is postulated that spread depends upon the level of interest rates, the volatility of interest rates, the maturity of the credits and risk variables as shown in equation (1).

(1) Spread = f (interest rates, volatility, maturity, risk)

The construction of a series which captures the volatility of interest rates without also capturing their level presents a bit of a problem Using the variance or standard deviation of interest rates over the quarter is not satisfactory, as we would expect either to be highly correlated with the level of interest rates. For example, a standard deviation of 0.5 may reflect a great deal of volatility when interest rates are 5 percent, and reflect relatively little volatility when interest rates are 13 percent Using the coefficient of variation (which is the standard deviation divided by the mean) rather than the variance or standard deviation mitigates this problem

To investigate the impact of the variables mentioned above, a pooled cross-section time series regression of the following form was performed

(2) Spread = constant + b_1 rate + b_2 CV rate + b_3 mat + b_4 D_1 + b_5 D_2 + b_6 D_3

where

rate	=	the six-month Eurodollar interest rate
CV rate	=	coefficient of variation of the six-month Eurodollar interest rate
Mat	=	maturity
D_1	=	1 if the observation is that of a high-income developing country; 0 otherwise
D_2	=	1 if the observation is that of a low-income developing country; 0 otherwise
D_3	=	1 if the observation is that of an oil-exporting surplus country, 0 otherwise

The dummy variables were used to investigate if, on average, there are systematic differences in spreads between groups of countries. The coefficients on the dummy variables can be interpreted as risk premiums over what industrialized borrowers would pay.

The weighted average spread and maturity for each of the four groups (industrialized, OPEC, high-income developing, and low-income developing) were calculated from the World Bank's *Borrowing in International Capital Markets* data base Regressions were performed from the third quarter of 1973 to the third quarter of 1979, and the results are given below (t statistics in parenthesis).

(3) Spread = 2 093 − 0 072 rate + 3 092 CV rate
(16 00) (−5 59) (2 49)
−0.086 mat + 0.376 D_1
(−5 25) (5.62)
+ 0 484 D_2 + 0.147 D_3
(7 25) (2 09)
R^2 (adj) = 0 635, S.E = 0.236, DW = 1 36

Note that all coefficients have the expected sign, all are significant at the 5 percent level, and the regression explains 64 percent of the spread While strictly speaking this Durbin-Watson statistic is meaningless, as this is a pooled cross-section time series, it may indicate autocorrelation as, out of 99 error differences, only three are across groups

This relationship is flawed because it does not take account of changes in relative risk over time To handle that problem, a slightly different equation was estimated. The dummy variables were weighted by maturity, on the assumption that the risk premium for less than prime customers should be higher for longer maturities. The regression results are

(4) Spread = 2 365 − 0 078 rate + 3 080 CV rate
(10 32) (−6 13) (2 51)
−0 118 mat + 0 051 (D_1 x mat)
(−6 97) (5 74)
+0.069 (D_2 x mat)
(7 64)
+0.023 ((D_3 x mat)
(2.40)
R^2 (adj) = 0 644; S E = 0.234; DW = 1 42

Note that all the coefficients are the correct sign, all are significant at the 5 percent level, and the regression explains 64 percent of the dependent variable The Durbin-Watson improves marginally and the R^2 and standard error remain basically unchanged.