

# Conditions in the syndicated medium-term euro-credit market

*This article, which has been prepared mainly by A. E. Fleming and Mrs S. K. Howson of the Bank's International Division, examines some of the factors determining the volume of syndicated medium-term euro-currency lending and the terms attached to such lending, especially the spreads charged by the participating banks.<sup>(1)</sup>*

## Introduction

The syndicated medium-term euro-credit market developed rapidly in the 1970s and is now one of the most important channels for the international flow of capital. This market—for loans which are typically syndicated among an international group of banks and taken up mainly by governments and public sector agencies—has become a major source of balance of payments finance for both developed and developing countries. Conditions in the market—that is, the availability and cost of funds—are therefore matters of some importance.

This article is organised in three sections. The first describes the evolution of the syndicated loan market over the period for which data are available, with particular reference to changes in conditions in the market; it also explores how to define market conditions and in particular assesses the spread as an indicator of conditions. The second section outlines some of the hypotheses that have been put forward to explain the development of the market, and the third section describes an approach that has been found useful for analysing the behaviour of the market and for examining the alternative hypotheses. This last section also draws out the implications of the preferred approach for the validity of these hypotheses as well as for explaining the historical development of the market.

## The nature and history of the market

Publicised syndicated credits totalling \$72 billion were arranged in the market during 1979.<sup>(2)</sup> This represents a 25% increase over 1978 but some slowing down compared with the rates of growth in the two previous years. To place the market in the context of international banking transactions generally, outstanding publicised syndicated loans alone—about \$150 billion in December 1979—represented roughly one third of the net total of euro-currency claims outstanding.<sup>(3)</sup> Syndicated

medium-term euro-currency lending has also come to form a significant part of the balance sheets of international banks, although it is a small component of bank lending as a whole. (At end-December 1979, total outstanding domestic and international dollar lending of US banks was about \$2,000 billion<sup>(4)</sup> and outstanding domestic and international lending—in all currencies—of banks in six of the major industrialised countries<sup>(5)</sup> totalled some \$4,400 billion.) The syndicated loan market is thus a small segment of the total banking markets for dollars and other currencies, albeit one which has grown rapidly.

The interest and importance of the market lies not only in its rapid growth and in its role in the recycling of OPEC surpluses, but also in the distinctive nature of this form of intermediation. Syndicated medium-term euro-credits are for the most part 'roll-over' credits, whose price to the borrower has three components: an interest rate altered every three, six, nine or twelve months<sup>(6)</sup> in line with ruling short-term interest rates (usually the London inter-bank offered rate on euro-dollars—LIBOR); a premium, or spread—which is usually fixed for the life of the loan—over the floating interest rate; and various fees. For the lending bank, LIBOR represents the cost of the funds lent;<sup>(7)</sup> the spread (together with the fees) constitutes its net revenue, covering the costs of intermediation and profits made on syndicated lending. The costs to be covered include the risks attached to maturity transformation, since, although banks finance syndicated euro-credits mainly by short-term deposits, the final maturities of these medium-term loans<sup>(8)</sup> in practice range up to fifteen years.

## Developments since 1973

By the end of the 1960s, the market for euro-dollars—which had emerged in the 1950s—had matured into a well-developed international market for short-term funds denominated mainly in US dollars, but also in other major

(1) The authors would like to thank a number of colleagues for their help, especially C. J. Davies, J. G. Ellis and R. B. Johnston.

(2) Data on the size and terms of some syndicated loans are readily available since banks typically publicise their participation, often by means of 'tombstone' advertisements in the press. There is also, however, a significant amount of unpublicised medium-term lending, particularly loans which are not widely syndicated. Anecdotal evidence suggests that terms on unpublicised loans may not differ much from those on publicised loans. Most of the data used in this article have been collected by the Bank of England.

(3) Euro-currency claims of banks in the BIS European reporting area, which comprises Austria, Belgium, Luxembourg, Denmark, France, West Germany, the Republic of Ireland, Italy, the Netherlands, Sweden, Switzerland and the United Kingdom.

(4) Total assets of all US commercial banks and savings banks.

(5) Total assets of banks, broadly defined, in the United States, the United Kingdom, Japan, West Germany, France and Switzerland.

(6) The roll-over periods for the loan tranches can usually be chosen by the borrower in the light of prospective movements in short-term interest rates.

(7) The rates that individual banks pay for inter-bank deposits vary and, at times, some banks have been obliged to pay considerably more than others for funds in the inter-bank market. Banks may also be able to attract non-bank deposits at lower rates than inter-bank deposits.

(8) In this article, medium-term syndicated loans refer to syndicated loans with a maturity of at least three years.

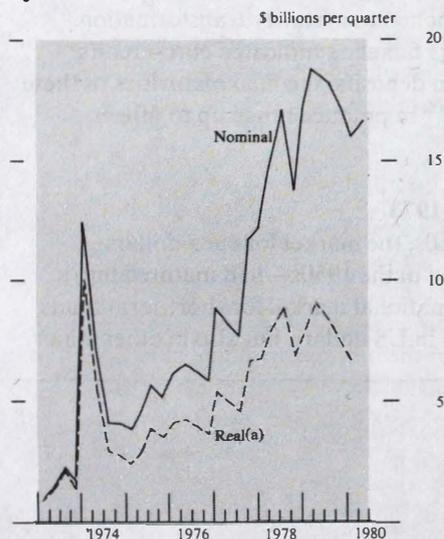
currencies.<sup>(1)</sup> Its development reflected the increasing financial integration of the world economy in the 1960s and was further encouraged by the general relaxation of capital controls in the 1970s. The introduction both of the medium-term roll-over credit and of the technique of syndication has maintained the momentum of the growth of the euro-currency markets and has encouraged the entry of new borrowers and lenders.

Roll-over credits reduce the risk faced by longer-term borrowers and lenders that they will find themselves locked into paying more or receiving less than current interest rates when market rates change. The syndication process also increases the size of loans available to borrowers (thus enhancing the attraction of such loans to sovereign borrowers) without necessarily increasing the risk to individual lenders. Large US banks with a base in the major reserve currency play an important role in the market. The participation of smaller banks and banks not based in the United States is facilitated by the syndication technique and by the wholesale and inter-bank markets in euro-currencies.

The Bank of England began to collect systematic data on the syndicated medium-term market in 1973. At that time, conditions were favourable to borrowers, with low average spreads, long maturities and a large average loan size. Early in 1974, in the wake of the oil price increases, lending rose (see Chart A), although the peak in the first quarter is mainly explained by the bunching of several exceptionally large loans.<sup>(2)</sup>

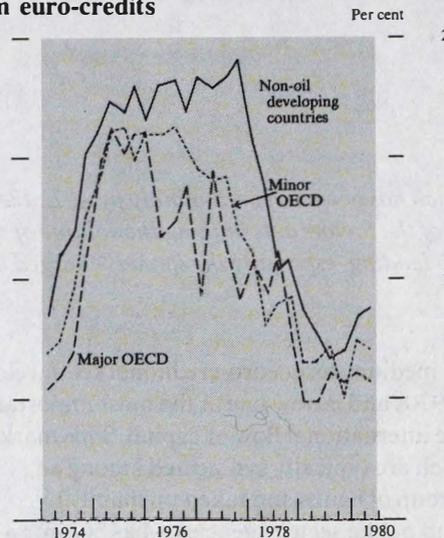
The oil-induced increase in the external indebtedness of some countries coincided with a tightening of terms. Spreads rose (see Chart B), while maturity and average

**Chart A**  
Syndicated medium-term euro-credits

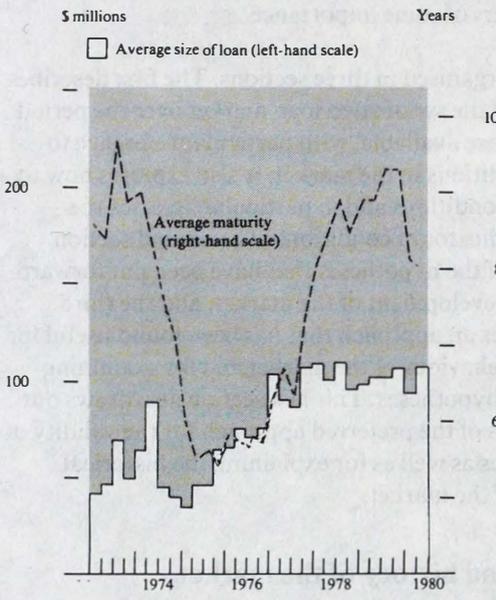


(a) Deflated by the *International Financial Statistics* index of export prices for industrial countries.

**Chart B**  
Average spreads on syndicated medium-term euro-credits



**Chart C**  
Other indicators of borrowing conditions



loan size fell (Chart C). Competition for business among lending banks, which had intensified during 1972-73, appeared to subside at a time when the Japanese banks were withdrawing from the market. The recycling of the large OPEC surpluses was made more difficult for the banks by the potential volatility of the OPEC deposits (which were placed at short term with a small group of banks) and by the need for maturity transformation to satisfy the longer-term requirements of borrowers with deteriorating balance of payments positions. Furthermore, there was a succession of banking failures, the most crucial of which proved to be that of the Cologne bank, I. D. Herstatt, in June 1974. This undermined confidence in the inter-bank market, raising short-term interest rates generally and producing 'tiering' whereby inter-bank rates rose further for some banks than

(1) The euro-currency markets comprise deposit and loan markets in several currencies and several maturities. Here, four will usually be distinguished: for short-term deposits, of which the inter-bank market is a major part; for short-term credit lines; for syndicated medium-term credits; and for euro-bonds.

(2) These included \$2.5 billion for the UK Government, \$1.5 billion for France and \$1.2 billion for Mediobanca (Italy). These compare with an average loan size of only \$77 million over 1973-79.

for others. In the event, the recovery in confidence in the inter-bank market was quite rapid, and short-term euro-currency interest rates returned to their 'normal' levels by mid-1975,<sup>(1)</sup> but conditions in the medium-term credit market remained tight throughout 1975.

In 1976, conditions began to ease. Lower spreads for prime borrowers and a higher average size of loan were followed in 1977 and 1978 by lower spreads and longer maturities for other borrowers. Conditions continued to ease into 1979, and by late that year were reminiscent of those in 1973 and early 1974. Lending in this "borrowers' market" was greater, both in real and in nominal terms, than in the earlier period, with an increase in the number of credits arranged and also a larger average size of loan (see Chart C). Many borrowers began to tap the syndicated loan market regularly, and a much wider range of borrowers gained access to the market. Some borrowers took advantage of easier conditions to renegotiate or refinance prematurely loans which had been taken out when conditions were tighter.

The decline in spreads appears to have ended in late 1979 and early 1980, following the measures taken by the US monetary authorities to support the dollar, the consequent sharp rise in short-term interest rates, a new withdrawal by Japanese banks, and the Iranian and Afghanistan crises. Since the end of 1979, spreads have increased for some non-prime borrowers, maturities have shortened, and there has been a fall in the number of credits, although the average loan size has remained much the same.

Over the 1973-79 period as a whole, there appears to have been a cycle in conditions with two phases of ease—the borrowers' markets of 1973-74 and 1978-79—and relatively 'tight' conditions in between. The recent borrowers' market, in which virtually all borrowers were able to negotiate successively finer terms, seems to have ended for all except the most highly-rated borrowers.

### Market conditions

There are several problems involved in choosing the appropriate indicators of conditions and in assessing whether any one indicator faithfully reflects the state of the market.

The easy conditions typical of a borrowers' market appear to be characterised most simply by high loan volume, reflecting both a large number of credits and a large average size of loan. However, the total loan volume includes loans which represent refinancing. Furthermore, a high loan volume would not imply easy market conditions if lending were to be restricted by the banks' exposure limits.<sup>(2)</sup>

Defining market conditions by reference solely to the 'price' on syndicated lending also poses some problems. Although both the floating interest rate and the fixed spread are relevant to the borrower, it is important to determine which price adjusts so as to clear the market. Since LIBOR is primarily determined in the market for short-term euro-currency funds and is closely linked to short-term interest rates in the United States<sup>(3)</sup> it seems likely that the spread adjusts at least in part to balance the supply and demand for intermediary services provided in the syndicated market. A complicating factor is the existence of fees incurred by the borrower, typically a management fee, a participation fee and a commitment fee. If fees are adjusted to compensate for movements in the spread, the spread will be a poor indicator of market conditions. A related question is whether the general level of spreads, or the prime spread (which would be charged to a prime borrower), is the better indicator of conditions, given that spreads tend to vary between different categories of borrower.

An increase in final loan maturities would also indicate easier conditions. There is, however, the possibility of a trade-off between spreads and maturities. In a tightening market, borrowers might be expected to accept shorter maturities rather than concede higher spreads. Spreads could thus respond with a lag and, in the interval, fail to reflect changed conditions.

An attempt to estimate a relation between spreads and maturities in a study carried out in the Bank of England failed to discover any stable systematic cross-section relationship. Over time, spreads and maturities were inversely correlated. With respect to a trade-off between fees and spreads, the results of another Bank study strongly suggested that an inverse relationship was not typical; both time-series and cross-section data implied that fees varied in a similar manner to spreads. If, as this evidence suggests, higher spreads are generally accompanied by higher fees and shorter maturities, the level of spreads can be taken as a reliable indicator of conditions in the syndicated loan market.<sup>(4)</sup>

### Issues and hypotheses

This section examines two issues relating to the development of the syndicated medium-term euro-credit market: the reasons for the increased volume of lending and the factors which influence the terms upon which the lending is arranged. In view of the argument above that conditions in the market can be represented by the spread, the second issue can be reduced to one of identifying the factors which determine movements in the spread.

(1) See R. B. Johnston, 'Some aspects of the determination of euro-currency interest rates', in the March 1979 *Bulletin*, page 35.

(2) On the considerations which determine banks' exposure limits, see Ishan Kapur, 'The supply of eurocurrency finance to developing countries', *Finance & Development*, vol. 14, no. 2 (September 1977), pages 32-5.

(3) See the article in the March 1979 *Bulletin*, and R. J. Herring and R. C. Marston, *National Monetary Policies and International Financial Markets* (Amsterdam: North-Holland, 1977), especially Part III.

(4) The average spreads, for three groups of borrowers have been used in empirical work reported here. The prime spread is not directly observable when there are no prime borrowers in the market, and the average spread on all new loans would be biased upwards at the same time.

The spread and the volume of lending may thus be taken as the price and quantity variables in the syndicated loan market. It is, however, also necessary to consider whether behaviour in the market can be described in terms of the economists' traditional 'partial equilibrium' approach. In other words, can supply and demand in this market adequately explain the volume and price of syndicated lending, or is it necessary to analyse the several interrelated euro-currency markets together? The statistics at the beginning of this article show that, although there is a large absolute volume of lending in the syndicated loan market, it is nonetheless a relatively small segment of the world market for dollars and other currencies. Although conditions in other segments of the global dollar market influence those in the syndicated loan market, the effect of the syndicated market on the other markets may be small. A 'partial' approach, which ignores these feedback effects, can therefore be a useful framework of analysis for this market, at least as a first step.

The hypotheses which have been put forward to explain the growth of syndicated lending and the determination of conditions in the syndicated loan market can be divided into those which emphasise the role of the demand for intermediation and those which concentrate on factors influencing the supply of loans by the banks. It will be seen, however, that several factors affect both demand and supply (though not necessarily symmetrically).

#### Demand theories

An explanation for the growth of syndicated medium-term lending since 1973 which emphasises demand factors is the general increase in the absolute size of payments imbalances, particularly the deficits of developing countries relying on imported oil. On this view, the syndicated medium-term euro-credit market has grown in response to those countries which have been unable or unwilling to rely on the traditional sources of foreign lending (the foreign bond markets and international agencies). The international banks have been able to meet this need by drawing on the increased supply of funds generated by the enlarged surpluses which are the counterparts of the increased deficits. These funds may have been deposited directly in the euro-currency markets by private wealthholders or central monetary institutions, or they may have been acquired from domestic banking systems via the inter-bank market. Since, at least in principle, the inter-bank market allows banks to adjust their deposits to the demand for their loans, the size of the medium-term euro-credit market is seen as essentially demand-determined.<sup>(1)</sup>

This view does not itself have implications for the movement of spreads. This must depend on the conditions under which suppliers of intermediary services

are prepared to change the volume of their business. An exclusively demand-based theory would postulate that the supply was infinitely elastic—that is, that banks are willing to supply any desired volume of loans at the existing level of spreads. There must, however, be a presumption that the spread will be determined by the underlying costs incurred by banks in their role as intermediaries—more specifically, by the marginal cost of intermediation.<sup>(2)</sup>

This raises the issue of the extent to which banks involved in euro-currency lending manage their liabilities.<sup>(3)</sup> The issue is relevant because a pure demand theory of syndicated lending would assume that the banks are perfect liability managers—that is, they are able and willing to obtain the deposits needed to match any increase in loans at the going rate (LIBOR) in the wholesale money markets. This in turn assumes that banks are indifferent to the source of their deposits and, for instance, regard maturity transformation on the basis of inter-bank deposits as no more risky than maturity transformation on non-bank deposits.

Alternatively, an increase in non-bank deposits might raise banks' perceived liquidity more than an equal increase in inter-bank deposits because they are a cheaper or more stable source of funds; in that case, an inflow of non-bank funds might induce banks to seek to lend more at the current level of spreads or be prepared to lend at lower spreads. An easing of conditions in the syndicated medium-term market could then be at least partly determined by the supply of deposits. Whether or not international banks are pure liability managers is, of course, an empirical matter, and is considered further below.

#### Supply theories

Another set of hypotheses focuses on factors affecting the supply of intermediation—that is, on the behaviour of the lending banks.

The most general of these hypotheses seeks to explain the growth of syndicated lending as part of the internationalisation of banking generally. Aided by the relaxation of capital controls, banks have been diversifying their portfolios by increasing their international lending at short term and longer term, in their own and other currencies, and through head offices, or branches and subsidiaries in offshore markets.<sup>(4)</sup> The adjustment of bank portfolios in this direction has been helped by innovations such as the development of the inter-bank market and the technique of syndication (see above). The international financial markets have broadened, deepened and become more competitive, with the result that the innovations themselves have encouraged faster market growth.

This explanation for the growth in the volume of syndicated medium-term lending during the 1970s has implications for the longer-run behaviour of spreads. The

(1) See, for example, H. R. Heller, 'Assessing euromarket growth: why the market is demand-determined', *Euromoney*, February 1979, pages 41-7.

(2) The nature of these costs is considered in the section headed 'Analysis and implications'.

(3) On US banks' use of the euro-currency markets for liability management, see F. H. Klopstock, 'Euro-dollars in the liquidity and reserve management of United States banks', *Federal Reserve Bank of New York Monthly Review*, July 1968.

(4) For a discussion of portfolio diversification by US banks see D. T. Llewellyn, 'International banking in the 1970s: an overview', in *A Framework of International Banking*, edited by S. F. Frowen (Guildford: Guildford Educational Press, 1979).

internationalisation of banking, and the financial innovations which have facilitated it, would tend to shift the supply curve of syndicated loans rightwards and hence, other things being equal, lead to lower spreads. This view thus implies a secular decline in spreads, at least until banks' portfolio adjustments have been completed and while demand effects are ignored.

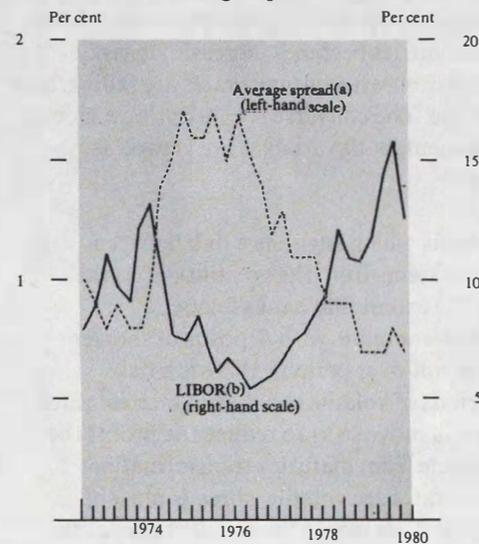
The diversification of bank portfolios between international and domestic lending can also be used to explain shorter-run changes in conditions. One such hypothesis is that banks have increased their participation in euro-currency lending at times of slack domestic demand for loans, when the generally low returns have induced banks to switch into higher-yielding, or less risky, international assets.<sup>(1)</sup> A related, but more general view, stresses the opportunity costs of syndicated loans—that is, the returns (allowing for risk) on alternative assets such as domestic lending, short-term euro-currency lending, and floating-rate notes. Hence, the price and volume of syndicated lending will depend on the yields on other international assets as well as on domestic bank assets.

One hypothesis proposed to explain conditions in the euro-currency markets which emphasises the supply of funds to the banks stresses the unique role of the balance of payments position of the United States. Since the US dollar has been (and still is) the major international reserve currency, a larger US current account deficit can in principle be financed merely by the increased holding of US dollars by the rest of the world. This would, *ceteris paribus*, increase euro-currency deposits, since the rest of the world is unlikely to hold in the United States all the extra money it receives in payment for its increased exports. At the same time, the demand for loans might fall because of an improvement in other countries' balance of payments positions. An easing of conditions in the syndicated market could ensue.<sup>(2)</sup> On the other hand, a correlation between an increasing US current account deficit and easier conditions in the syndicated loan market could simply reflect the operation of other factors, such as the state of the world economy, which impinge both on US trade and on the syndicated loan market.

US monetary policy has often been considered to be an important influence on conditions in the euro-currency markets. US monetary conditions are indeed a dominant influence on the euro-dollar deposit rate (LIBOR) and on other short-term euro-currency interest rates, but the way in which they might affect the volume of lending and spreads in the syndicated medium-term market is less clear.

It has sometimes been suggested that movements in spreads are causally related to movements in LIBOR, because an apparent inverse relation between LIBOR and

**Chart D**  
**LIBOR and average spread**



(a) Weighted by size of loan.  
(b) London inter-bank offered rate on three-month euro-dollar deposits.

spreads can be detected for much of the 1973–79 period (see Chart D). Such a relation does not, however, appear to have continued in 1980. One possible reason for an inverse relation is that higher interest rates endow banks with a greater return on their capital.<sup>(3)</sup> This endowment would enable them to achieve a target rate of return with lower spreads. Thus, rising interest rates might encourage banks to lower spreads in order to increase their lending. It is also possible, if borrowers are sensitive to the total interest cost on syndicated loans (LIBOR plus spread), that banks may be prepared to lower spreads to compensate for higher LIBOR when faced with an expected fall in demand. There is, however, little evidence that banks are prepared to do so.

Another possible explanation of an inverse relation derives from the institutional difference between domestic deposits, upon which reserve requirements are normally imposed, and euro-currency deposits, which tend not to attract such requirements.<sup>(4)</sup> Differential treatment of domestic and euro-currency deposits means that as short-term interest rates rise it becomes increasingly costly for banks to have assets tied up in non-interest-bearing or low-earning reserves. Accordingly, as short-term rates rise, some flow of funds to the euro-currency markets may be encouraged, resulting in lower spreads.

An inverse correlation does not imply causation, and may be due to other factors. One possibility is that it may be due to a lag in the response of banks to changed monetary conditions. An expansionary US monetary policy will increase monetary growth, which increases bank liquidity and tends to raise nominal interest rates by raising expectations about inflation. A fall in spreads and a rise in

(1) See footnote (4) on the previous page.

(2) See K. Inoue, *Determinants of market conditions in the euro-currency market—why a 'borrowers' market?*, BIS Working Paper No. 1, April 1980.

(3) An endowment effect is also likely to be operative in the case of a bank with a domestic non-interest-bearing deposit base.

(4) The burden of reserve requirements on domestic deposits varies between banking systems: in the United States, required reserves bear no interest, while in the United Kingdom reserves other than cash earn the market rate on reserve assets.

LIBOR could then be observed together, with both deriving from the expansionary policy. Another argument, which attributes the inverse movement to a common cause, is that lending to deficit countries becomes increasingly risky during a global recession when interest rates are falling, and spreads therefore rise. The converse is true during a global boom. In this argument, both variables are viewed as moving cyclically.

A different hypothesis which suggests a link between LIBOR and spreads stems from the volatility of banks' funding costs. To the extent that banks finance medium-term roll-over credits with deposits of shorter maturities than the roll-over periods, there is a risk, particularly in periods of volatile short-term interest rates, that deposit rates will move so as to reduce the profits the bank might have made from maturity transformation. Thus, when interest rates are volatile, spreads must be higher than they otherwise would be in order to cover this potential threat to profits.<sup>(1)</sup>

Another factor influencing the banks' supply of syndicated lending could be 'shocks' to the syndicated market. For example, the collapse of the Herstatt Bank in 1974 may have had both a direct effect on market confidence, reducing the supply of funds to the banks in the international financial markets, and an indirect effect in stimulating banks to review the riskiness of their loan portfolios. This latter effect induced banks to seek a higher risk premium—that is, larger spreads—particularly for less creditworthy borrowers.<sup>(2)</sup>

Indeed, an extreme view of spread determination attributes the cyclical movement in spreads entirely to changing risk perception by the banks. A variant of this view is that in periods of heightened risk perception some rationing of funds to less creditworthy borrowers occurs as banks review their country exposure limits.

## Analysis and implications

This section outlines an approach which has been found helpful in analysing this market. Recent empirical evidence is used to interpret developments since 1973.

As indicated earlier in this article, a partial approach to analysing the syndicated medium-term market implies that the analysis can take the form of assessing separately the factors affecting the supply and demand for intermediary services. The adoption of a partial approach to the analysis of a financial market also raises the question of how to represent the behaviour of the financial institutions

involved. In the case of the international banks operating in the syndicated medium-term market, the academic literature on banking provides two approaches.<sup>(3)</sup> One is to treat the banks as 'firms' producing intermediation services whose price is the spread. If the syndicated market is highly (strictly, perfectly) competitive, the spread determined in the market will equal the marginal cost of intermediation.<sup>(4)</sup> The other approach, which has been found more fruitful, is to apply to international banking activities the conventional 'portfolio approach' as applied to the analysis of domestic financial institutions. The bank is then seen as allocating its capital and other funds between competing assets, domestic and international, on the basis of the returns and risk attached to each of the available assets. Since the bank's liabilities are simply the other side of its balance sheet, its management and its use of liabilities can also be analysed within this framework.<sup>(5)</sup>

### The portfolio approach

According to the portfolio approach, banks' lending decisions reflect the returns and risks on all available assets and liabilities; other factors, such as US monetary conditions, change banks' decisions in so far as they change the banks' estimates of risks and returns. It is these estimates that determine the spreads that a bank seeks to charge on its lending.

The application of the portfolio approach to this market places the spread at the heart of the analysis. Spreads (together with fees) cover the costs of intermediation and include the profits which the banks make on their syndicated lending. The costs include the opportunity cost of syndicated lending—that is, the returns available on other forms of lending, both domestic and international. The costs of intermediation also comprise the costs of risk-bearing, which include the risks of funding, interest-rate changes and default; although the use of roll-over credits reduces funding and interest-rate risks, it does not eliminate them. Just as the distribution of spreads among borrowers can be expected to reflect differences in the risks perceived by the banks in lending to different borrowers, so the general level of spreads can be expected also to reflect the relative risks and returns on syndicated medium-term lending compared with other lending opportunities such as domestic lending, short-term euro-currency lending, and the holding of euro-bonds.

The implication, therefore, of adopting the portfolio approach to analysing this market is that conditions in it are determined to a large extent by the risks and returns in competing domestic and international markets (see above). Some preliminary empirical work undertaken in the Bank

(1) See L. S. Goodman 'The pricing of syndicated eurocurrency credits', *Federal Reserve Bank of New York Quarterly Review*, vol.5, no.2.

(2) On the role of risk in determining the spreads charged to different borrowers see *International lending, risk and the euromarkets*, by A. Angelini, M.Eng, and F. A. Lees (London: Macmillan, 1979), pages 106-19.

(3) For a survey of the literature see E. Baltensperger, 'Alternative approaches to the theory of the banking firm', *Journal of Monetary Economics*, vol.6, no.1, pages 1-37. The two approaches are not mutually exclusive.

(4) See P. A. Davies 'A theory of the determination of spreads in the syndicated loan market', Chase Manhattan Bank, April 1980 (mimeographed).

(5) A formal model of international bank behaviour using this approach has been developed by R. B. Johnston, *Banks' international lending decisions and the determination of spreads on syndicated medium-term euro-credits*, Bank of England Discussion Paper, No.12, September 1980.

of England<sup>(1)</sup> attempts to throw light upon the factors influencing spreads, although the short run of available data for an evolving market means that the results are necessarily tentative. In equations estimated to explain the average spreads negotiated on loans for the major OECD, minor OECD and non-oil developing countries, a proxy for risk factors proved a significant explanatory variable for the last two groups of countries.<sup>(2)</sup> A proxy for the returns available on lending in domestic markets—specifically, implicit spreads on domestic lending calculated for the United States and West Germany—was found to exert a statistically significant positive influence on spreads. A proxy for funding risk did not, however, contribute significantly to explaining movements in spreads.<sup>(3)</sup>

Another supply side factor which was discussed earlier and which can be accommodated in the portfolio approach is the influence of increases in the non-bank supplies of funds to the international banking system. An increase in non-bank deposits may increase the banks' willingness to supply syndicated medium-term loans and tend to lower spreads. The empirical work already mentioned suggested that an increase in non-bank deposits (as a proportion of international banks' total liabilities) leads to a significant fall in the level of spreads. A corollary of this, which relates to the demand-determined theory, is that banks are not pure liability managers—that is, banks do not simply adjust their liabilities to accommodate loan demand at a constant level of spreads.

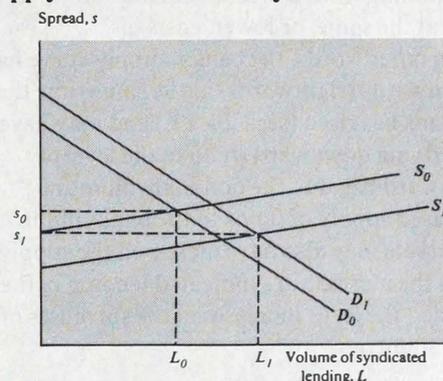
Two other findings of the empirical work based on the portfolio approach have implications for the hypotheses discussed above and for the interpretation of market conditions since 1973. The first of these is that the three-month euro-dollar rate did not prove to be a significant factor in explaining spread movements (see the earlier discussion of the relationship between LIBOR and spreads). This suggests that any inverse relation between these two variables arises from other factors which impinge on both of them. The second finding was that the volume of lending was found to be negatively related to the movement in spreads. The interpretation and implications of this result are explored further below.

#### A simple analysis

Conditions in the syndicated loan market since 1973 can be explained in terms of increases in both the supply and demand for intermediation. These can be depicted diagrammatically by rightward shifts over time in the supply and demand curves, with their relative potency depending on the shapes (or elasticities) of the curves. The

empirical result reported in the previous paragraph can be interpreted in terms of either an unconventional downward-sloping supply curve or an upward-sloping supply curve that has been shifting over time. Although the syndicated loan market is dominated by the major international banks, many smaller banks participate in the market and there are a number of other banks which could enter it. The free entry to, and exit from, this competitive market implies that the banks' supply curve for syndicated loans may be highly elastic with respect to the spread. At the same time, the empirical finding of the importance of risk strengthens the view that, for an individual bank, an increase in lending exposure might encourage an increase in spreads, and points to a positively sloped supply curve for banks as a whole. A positive slope is also supported by the finding that banks are not pure liability managers and do not adjust their deposits to match their loans. Chart E therefore depicts a highly elastic supply curve with a positive slope for syndicated loans.

**Chart E**  
Supply and demand for syndicated loans



On the demand side, it has been argued, by Mayer<sup>(4)</sup> among others, that the demand for syndicated loans is relatively inelastic with respect to euro-currency interest rates, since roll-over credits reduce the importance to borrowers of the absolute level of interest rates, which in recent years have also been very low in real terms (that is, allowing for expected inflation). Borrowers, at least those with access to other financial markets, are more likely to respond to changes in spreads. The Bank's empirical work included estimation of a simple equation to explain the demand for syndicated loans. It was found that changes in spreads exerted a greater influence on loan demand<sup>(5)</sup> than changes in LIBOR. It thus seems likely that the demand curve for syndicated loans as a function of the level of spreads is elastic, although perhaps less so than the supply curve (see Chart E).

(1) R. B. Johnston, Bank of England Discussion Paper, No.12, Section 3, to which readers interested in the technical details of the empirical work are referred.

(2) Perceived risk by banks cannot, of course, be measured directly. The proxy for default risk which performed satisfactorily in the minor OECD and non-oil developing country equations was a measure of reserve adequacy, the ratio of aggregate official reserves to imports. According to the estimated equations, an increase in this ratio would lower the average spread.

(3) The difference between the three-month inter-bank euro-dollar rate and the cost of certificates of deposit in the US secondary market (adjusted for reserve requirements and deposit insurance) was used to represent funding risk.

(4) See H. Mayer, *Credit and liquidity creation in the international banking sector*, BIS Economic Papers No.1 (November 1979), pages 57-8.

(5) See R. B. Johnston, Bank of England Discussion Paper, No.12. The results are very tentative at this stage.

In consequence, the size of the syndicated medium-term market is unlikely to be purely demand-determined. As demand expands, spreads will tend to rise—other things being equal—choking off to some extent the demand for loans. The volume of lending would then expand by less than the original increase in demand. If the banks' supply of syndicated loans were perfectly elastic with respect to the spread, the volume of lending would increase with no change in spreads. A high, though not perfect, elasticity of loan supply means that the change in the spreads due to a change in demand will be small, and hence that observed changes in spreads are more likely to reflect changes in the banks' willingness to supply syndicated loans than changes in the demand for such loans.

The main contention of this article is that conditions in the syndicated loan market during the 1970s can largely be explained by factors influencing the supply of loans by banks, in particular the evolution of the international banking system. Financial innovations have facilitated the diversification of bank portfolios into international loans and have enabled them to meet the increased demand for external loans stemming from increased balance of payments deficits at the same, or lower, costs of intermediation. In other words, the banks' supply curve has been shifting downwards (rightwards) at the same time that the demand for loans has risen (see Chart E) and may have imparted an underlying downward trend to the level of spreads and an upward trend to the nominal volume of lending. An increased supply of funds to the banks in the euro-currency markets may also have increased the supply of loans, although the increase in syndicated lending in the early 1970s preceded the large increases in the surpluses of the oil-producing countries.

Shorter-run changes in conditions observed over the period have probably been due to simultaneous changes in the supply and demand for syndicated loans. The borrowers' markets of 1973–74 and 1978–79 may well reflect high bank liquidity which resulted from enlarged inflows of non-bank funds into the international banking system at the same time as buoyant loan demand. Many banks were also

induced to enter the market over both periods by the returns available relative to the perceived risks involved and by the opportunities for short-term portfolio diversification. The resulting competitive pressures tended to reduce the profitability of syndicated lending. Rising loan volumes were accompanied by falling spreads and lengthening maturities.

The tighter conditions in the syndicated loan market which prevailed in the 1975–77 period may be explained as follows. Although the flow of non-bank funds to the international banking system continued during this period, boosting the supply of loans, the rate of flow slowed. At the same time the demand for funds, resulting in particular from the balance of payments needs of non-oil-producing countries, continued to increase. This in itself would have resulted in upward pressure on spreads alongside continued, but slower, growth in the volume of loans. Other factors could also have shifted the supply curve upwards, offsetting at least temporarily its longer-run downward movement. Increased perceptions of risk on external lending would seem to be particularly important here.<sup>(1)</sup> Shocks such as the Herstatt banking crisis of 1974 have served to heighten banks' risk perceptions, and may also have reduced the supply of non-bank funds to the euro-currency markets. At such times there has also been a lowering of competitive pressures as some banks withdrew from the market.

It has been argued in this section that the application of the portfolio approach to the analysis of the syndicated loan market is useful in that it provides a theoretical and empirical basis for assessing the relative merits of the hypotheses outlined above. However, the availability and quality of data mean that the analysis must be fairly tentative. Further research is needed, in particular on the linkages between the syndicated lending market and its competing domestic and international markets. The intention of this article has been to summarise the factors believed to impinge upon the market, to suggest a framework for analysis and to offer some preliminary econometric findings.

(1) Lower interest rates could be another factor; the Bank's work so far has failed to find such an influence.