Off-Balance Sheet Activities and Financial Innovation in Banking*

1. Meaning of 'off-balance sheet'

Banks' off-balance sheet operations have grown rapidly in recent years. The 'off' balance sheet description denotes that the activities involve contingent commitments or contracts which generate income to a bank, but are not normally captured as assets or liabilities under conventional accounting procedures. Contingent items may be recorded in a bank's accounts as notes to the balance sheet, below the line, or in some cases not at all. Accordingly, off-balance sheet banking is known also as 'banking below the bottom line', 'contingent commitment banking', 'assetless banking', or 'invisible banking.[1]

Bankers have long engaged in such activities. Dealing in bank bills lay at the heart of the British financial system in the nineteenth century. Bankers' acceptances were one of the main instruments in the US money market in the 1920s. Banks have also long sought fee income from services such as the safekeeping of securities, and trust and fiduciary operations. What is new is the expansion of non-traditional items and the diversity of new instruments which has accompanied the rediscovery of old ones. Table 1 shows selected off-balance sheet positions of US banks from 1980 to 1987. Standby letters of credit have increased more than three and one half times since 1980, while foreign exchange positions have expanded seven-fold. Interest rate swap transactions outstanding in 1987 exceeded $ 451 billion while currency swaps are estimated at about $ 200 billion, both having grown from virtually nothing in 1981.

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[1] GIDDY (1986) introduced the expression 'assetless banking', KAREKEN (1987) prefers 'contingent commitment banking', while GARDENER (1986) refers to 'invisible banking'. Banking 'below the bottom line' is the term used by WOLKOWITZ *et al.* (1979).

TABLE 1

SELECTED OFF-BALANCE SHEET ACTIVITIES OF US BANKS, 1980-1987*
($ billions)

Year	Capital	Loan Commitments	Standby Letters of Credit	Commercial Letters of Credit	Foreign Exchange Commitments Outstanding	Interest Rate Swaps Out-standing
1980	108	na	47	20	177	na
1981	118	na	72	20	189	na
1982	129	na	100	17	215	na
1983	141	432	120	30	464	na
1984	154	496	146	30	584	na
1985	170	531	175	29	735	186
1986	183	572	170	28	893	367
1987	187	574	167	31	1241	451

* First quarter, 1987.
Source: Information supplied to author by Mr J. Chessen, Federal Deposit Insurance Corpn.

A variety of hypotheses have been advanced to account for this growth, and prominent amongst them are three.[2] The *regulatory tax hypothesis* views off-balance sheet banking as a way of avoiding so-called 'regulatory taxes', *i.e.* reserve requirements and deposit insurance premia, levied when financing occurs on-balance sheet. Under the *moral hazard hypothesis* banks are seen to have expanded, by means of the new activities, their business and risks relative to capital, knowing that customers are protected by explicit and implicit insurance coverage from regulatory agencies. An extreme statement by *The Economist* is that 'banks simply booked the fees and forgot the risk'.[3] Customers of banks may view the protection afforded to them differently, and in the *bank failure hypothesis* they prefer to purchase paper backed by a bank guarantee, rather than hold an uninsured deposit, because in the event of failure of the bank they still hold a direct claim against the debtor.

These explanations are part of the story and certainly the upsurge in off-balance sheet banking has coincided with the difficulties of the US money-centre banks and their switch from the strategic goal of asset growth which marked the 1970s to 'assetless' income-generating business in the 1980s. Amongst US banks, the large money-centre banks

[2] These hypotheses are examined by CHESSEN (1987), JAMES (1987) and PAVEL and PHILLIS (1987).
[3] *The Economist*, 18th December 1987, p. 92.

account for 75 per cent of standby letters of credit, 61 per cent of loan commitments and 97 per cent of foreign exchange transactions. At a world level, US banks undertake 83 per cent of 'swaps', arrange 68 per cent of note issuance facilities and distribute 67 per cent of Euro-commercial paper.[4]

Nevertheless, some general factors are at work which means that banks from other countries have an important involvement. For example, the gross value of the off-balance sheet business of Australian banks is three times the size of their balance sheet totals (Brady, 1987). The growth of off-balance sheet banking needs to be seen in a broader context of innovations in financial techniques in banking, and the factors identified in section 4 as important are altered conditions in banking markets, changes in the economic environment, arbitrage opportunities in capital markets and the impact of developments in financial technology. But first in the next section we look into the nature of off-balance sheet business and then in section 3 compare it with traditional banking operations.

2. Types of off-balance sheet business

Most discussion of off-balance sheet activities has focused upon those formal and informal arrangements which generate contingent claims against a bank, and thus give rise to potential balance sheet or portfolio risk. These are listed on the left hand side of Table 2. If the description 'off-balance sheet' refers to those activities which generate income without passing across the banking institution's balance sheet, then a much broader range of activities can be included. Some of these are listed on the right hand side of Table 2.

Many of the latter activities are an extension of existing customer-bank relationships and enable banks to realise 'economies of scope' from conventional business. Branch facilities and capital equipment are multi-purpose and can be put to work for other transactions. Automated clearing houses set up for interbank settlement can be opened up to others enabling corporate customers to deliver instructions on magnetic tape for the direct crediting of salary payments. Computing facilities can

[4] *Euromoney* "Annual Financing Report", March 1987.

be used for establishing up of cash management systems for customers. Banks develop skills in portfolio management which can be put to use in advising customers and selecting their investments. Knowledge which a bank builds up of a firm's business is valuable when arranging the firm's acquisition of or merger with other companies.

When undertaking a number of fee generating activities banks are often described as acting as nonbank service organisations. This is to take a narrow view of banking. Customers' demands for financial services are not limited to the traditional payment facilities, deposits and loans offered by banks. They also wish to accumulate wealth and obtain security (or 'insurance') against the risks of financial loss. In order to acquire these 'non-banking' services, customers face inconvenience and travelling costs. They also must incur search time and information costs to establish the nature of the contractual arrangements and to verify whether the supplier is reliable. Opportunities are presented for banks to act as 'marketing intermediaries' for their customers, reducing access costs by offering a range of services under the one roof and trading on their established reputation by 'branding' other suppliers of financial services on an agency basis, so lowering customers' search and information costs.

This brings out that a bank's reputation and standing is at stake when it provides such fee-generating off-balance sheet services, and the impact upon a bank's conventional on-balance sheet operations may be considerable. They face operational or business risks in the costing of these activities, along with possible claims for negligence or breach of fiduciary obligations. These operations are far from riskless and, as Giddy (1986) notes, whereas transactions which create contingent liabilities can, at least in principle, be hedged in markets, the business risks, reputational consequences and liability for negligence are less easily offset.

Those off-balance sheet items which give rise to direct contingent claims are discussed under the four headings used in Table 2. Regulatory treatment in some countries (*e.g.* the USA) requires that some contingent claims (such as bankers' acceptances and repurchase agreements) be recorded on-balance sheet. Nevertheless, the process of shifting the asset itself off the balance sheet gives rise to costing benefits which merit their inclusion.

TABLE 2

SUMMARY OF OFF-BALANCE SHEET ACTIVITIES

CONTINGENT CLAIMS	FINANCIAL SERVICES
Loan commitments	*Loan-related services*
Overdraft facilities	Loan origination
Credit lines	Loan servicing
Back up lines for commercial paper	Loan pass throughs
Standby lines of credit	Asset sales without recourse
Revolving lines of credit	Sales of loan participations
Reciprocal deposit agreements	Agent for syndicated loans
Repurchase agreements	
Note issuance facilities	*Trust and advisory services*
	Portfolio management
Guarantees	Investment advisory services
Acceptances	Arranging mergers and acquisitions
Assets sales with recourse	Tax and financial planning
Standby letters of credit	Trust and estate management
Documentary or commercial letters of credit	Management of pension plans
Warranties and indemnities	Trusteeships for unit trust, pension plans and debentures
Endorsements	Safekeeping of securities
Financial support to affiliates or subsidiaries	Offshore financial services
Swap and hedging transactions	*Brokerage/agency services*
Forward foreign exchange contracts	Share and bond brokerage
Currency swaps	Mutual fund (unit trust) brokerage
Currency futures	General insurance brokering
Currency options	Life insurance brokering
Cross-currency swaps	Real estate agency
Interest rate swaps	Travel agency
Cross-currency interest rate swaps	
Interest rate options	*Payment services*
Interest rate caps, floors and collars	Data processing
	Network arrangements
Investment banking activities	Clearing house services
Securities underwriting	Credit/debit cards
Securities dealership/distribution	Point of sale systems
Gold and commodities trading	Home banking
Market-making in securities	Cash management systems
	Export/import services
	Correspondent banking services
	Trade advice
	Export insurance services
	Countertrade exchanges

Commitments

Here a bank has committed itself to advancing funds and acquiring a credit exposure in the form of an asset at some future date. Some commitments are irrevocable (revolving lines of credit), binding upon the bank in all circumstances, although there may be a predetermined date by which the option to borrow must be exercised. In others, the bank will only be called upon to advance funds when other parties have refused to do so (*e.g.* note issuance facilities). Finally, there are the looser commitments where a bank has agreed to a facility, but has legal right to withdraw it in certain circumstances (*e.g.* overdrafts).

Guarantees

Under this heading are included some of the more traditional off-balance sheet exposures, where a bank has underwritten the obligations of a third party and currently stands behind the risk. By adding its name, the bank relieves counterparties from having to undertake a detailed investigation into the customer's ability and willingness to comply with its contractual obligations. Guarantees can be functionally divided into two groups, according to whether the obligations guaranteed are financial or non-financial (or perfomance-related). Some instruments such as standby letters of credit 'guarantee' both types of obligations. Performance-related guarantees back international trade or bid and performance contracts such as in the construction industry. They essentially support the good name of a customer (and his ability to perform under a particular contract) and enable him to continue trading activities. Financial guarantees enable a customer to obtain funds from a third party on the strength of the bank's name, which it in effect rents for a fee, as under loan guarantees and standby letters of credit which back financial obligations such as loans, issues of municipal bonds and commercial paper issues, and asset sales with recourse. Failure of a party on whose behalf a guarantee has been written may trigger an immediate loss, or, more usually, will result in the bank acquiring a claim over assets or goods of various kinds.

Swap and hedging transactions

These items are essentially interest rate and foreign exchange rate agreements, in most cases binding on both parties but in some cases exercisable at one party's discretion (*e.g.* options). A distinction needs to be made between 'exchange-traded' contracts and 'over-the-counter' (or non-exchange traded) contracts, the latter being tailor-made packages written by banks for their customers. Currency and interest rate futures are exchange traded. Forward foreign exchange and forward rate and break-forward agreements, interest rate and cross-currency swaps, interest rate caps, floors and collars are all customised products. Currency and interest rate option contracts can be one or the other. With the exception of currency swaps, no exchange of principal is generally involved. Where the transaction is unhedged, the bank is exposed to movements in interest rates or exchange rates. Whether the transaction is unhedged (*i.e.* designed deliberately to open up an exposure) or hedged (to neutralise a position exposure), the bank is vulnerable to the creditworthiness of the counterparty (the ability to carry out its side of the contract).

Securities underwriting

A major exposure for banks operating outside the US comes from the banks' involvement in investment banking and merchant banking activities, including the organisation of mergers and securities issues associated with leveraged buyouts, and also securities underwriting, especially of Eurobonds. The major organisers of the placements of Eurobonds are securities houses or 'universal banks'. Nevertheless, several commercial banks feature amongst the leading firms. Significant amounts of Eurobond issues are 'swapped' (26 per cent in the first half of 1987) and banks are sometimes able to gain the underwriting business by virtue of competitive pricing on the swap component of the transaction.

One of the attractions of Euromarkets comes from the ability of commercial banks (and especially those from the US and Japan) to be also investment banks, free of the lines of demarcations which exist in domestic markets. US banks are no longer debarred from engaging in securities business, despite the constraints of the Glass-Steagall Act. Through affiliates, they are in fact able to underwrite or distribute 80

per cent of domestic securities issues, including commercial paper. Underwriting of corporate bonds and equities is still prohibited, and this applies also to the foreign branches of US banks. But the ownership of foreign subsidiaries enables the banking organisations to conduct a broad range of financial activities, and most of the large US banks have merchant or investment banks in London underwriting corporate debt and equity securities. These subsidiaries frequently syndicate placements of both Eurobonds and international loans.

3. Comparison with traditional banking operations[5]

Banks are often depicted as being in a continuous duel with securities markets for the provision of financial services, and frequently banking intermediation and capital market activity are seen as alternatives. In many respects this is indeed the case. Like all firms, banks owe their existence to the costs of direct transactions and the costs of acquiring information services, and to the achievement of scale economies in the conduct of particular activities. As such, the scope for banking intermediation is vulnerable to developments in information technology which reduce transactions and information costs, and is enhanced when there are concerns about risk and liquidity. But in other respects it is wrong to see a sharp division between banking and securities markets and a blurring between the two is apparent when we compare off-balance sheet business with traditional banking intermediation.

When using securities markets for their financing, borrowers and lenders face certain information costs. Lenders must ascertain borrowers' attributes, monitor their performance, and possibly devise workout solutions. Borrowers face the costs of providing the information which lenders require and of entering into covenants which ensure compliance with the contract.

Lenders also have credit risks and liquidity needs. Assets backing an issue of securities may prove to be worthless or decline markedly in value, while borrowers may be tardy in repaying loans or may default.

[5] This section draws heavily upon LEWIS and DAVIS (1987).

Spending opportunities and consumption needs may present themselves which lead the lender to want to sell off all or part of the funds lent out. Borrowers are generally unable to provide the risk diversification sought after by lenders; nor, generally, are they well placed to meet lenders' liquidity needs.

Banks and other financial intermediaries specialise in obtaining and using information about credit risks. They acquire proprietary information because firms can thereby avoid having to make business information available through market releases. As providers of transactions services, banks have access to sources of information which enable them to select better loans and monitor their performance at lower costs than would otherwise be the case, or if they sought to use credit rating agencies. These information services are provided when lenders hold claims against financial intermediaries, and delegate to them decisions about the allocation of savings to various ends.

Banks and other intermediaries offer a flexibility which markets do not provide. In the US commercial paper market, secondary marketing is limited to that paper which distributors are themselves prepared to buy back. CDs are marketable, but dealer spreads make it costly to buy paper with specific maturity dates and paper with one or two week's maturity is almost never sold. Banks, by contrast, allow depositors to withdraw balances on demand or at short notice, and moreover at full face value. Yet they themselves hold large portfolios of securities with limited saleability and which individually have risk.

Banks are able to offer customers these assurances in part because informational advantages enable them to select assets which have low individual default risks and in part because their portfolio size enables maturities of assets to be staggered to match anticipated deposit withdrawals. They also offer a risk pooling service, exploiting the regularities which emerge when large numbers of withdrawal options and loan defaults are combined. Some of this pooling takes place within the banking institution, as is the case in retail banking. With wholesale banking, most of the pooling occurs across institutions, with loan risks spread by participations and liquidity needs shared out among the group of banks which make use of interbank funding markets and correspondent links. Customers could 'break lots' themselves by spreading deposits and writing loans with a number of banks, but the syndication procedures developed by banks and the established interbank markets enable this process to be carried out at less cost. By straddling the retail and wholesale sectors of the capital market, banks

perform a size intermediation function and tailor-make financial packages to customers' needs.

Hence the traditional on-balance sheet borrowing and lending operations of banks can be seen to be packages of information and risk-sharing (or insurance) services.

We are used to thinking of banks as a collection of assets and liabilities making up a balance sheet. The conception which underlies Figure 1 is of a bank as a collection of contracts. These contracts define the information and risk-sharing services provided by banks to their customers. The upper portion of the Figure shows the services which are embodied in the traditional on-balance sheet deposit and loan contracts offered by banks. In offering these services, banks ameliorate the financing risks which their customers face by taking on part of the risk. For this, they receive remuneration in the form of service charges and interest rate spreads, when lenders are prepared to forego interest income to obtain the bank guarantee.

Off-balance sheet activities are also vehicles for information and risk-sharing services. As such, they ameliorate financial risks incurred by bank customers and impose risks on banks. The establishment of a credit line earns a bank a commitment fee, affords the customer protection against liquidity needs, but exposes the bank to offsetting liquidity risk which it is better able to bear. Banks also protect customers against, and themselves incur, asset risk through activities such as bill acceptances and standby letters of credit. In both cases, banks essentially guarantee payment of a customer's liability to a holder of its debt should the customer default. Fees charged to the customer reflect the benefits of the lower interest rate required by the market on the customer's paper once a bank guarantee of payment is attached. Although the initial incidence of the fee is on the bank's customer (the borrower), the ultimate effect of the lower yield is equivalent to the holder of risky (higher yielding) paper paying a premium to the bank, in terms of foregone interest, for protection against default. This is analogous to a depositor accepting a guarantee from a bank in lieu of unguaranteed interest income on primary securities.

The lower portion of Figure 1 shows how the characteristics which feature on-balance sheet can be provided off-balance sheet by a variety of instruments. Lenders' credit risks are met on-balance sheet by deposits which are repayable at par; the bank guarantee can be provided alternatively by standby letters of credit and bankers acceptances backing the borrowers' name. Banks transform short term deposits

into longer term guaranteed funding to borrowers, a process which can be achieved off-balance sheet by revolving credit lines or note issuance facilities which put short term paper in the hands of lenders while guaranteeing long term funding to borrowers.

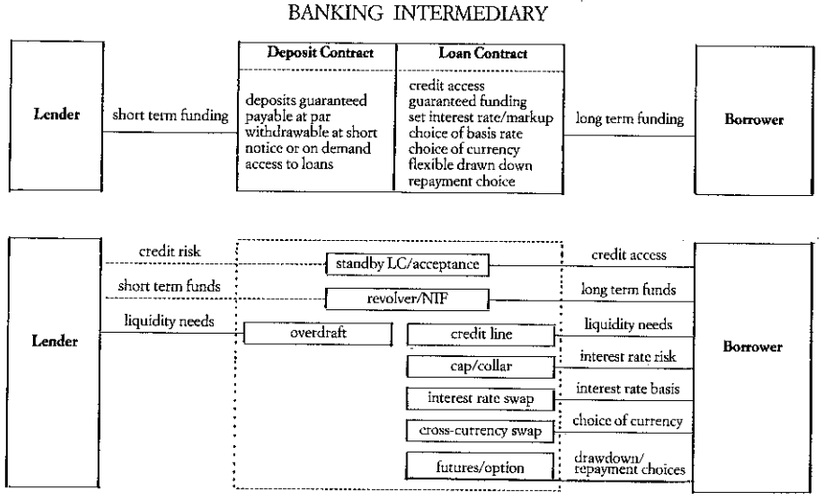
From the viewpoint of borrowers, the interest rate risks they face can be averted by writing cap or collar contracts with the bank. A cap is a put option which acts as a hedge to the buyer against rising interest rates. A floor is a series of call options and when combined with a cap in a collar acts much like a fixed rate of interest. When borrowers negotiate a syndicated loan they are normally allowed to choose the interest rate basis (LIBOR, CD rate, US prime, CP rate), the currency of interest rate and principal, and when to draw down the loan. These choices can be exercised also off-balance sheet by means of basis swaps, coupon swaps, currency swaps (for altering interest rates), back-up credit lines (for liquidity needs), and futures or forward contracts (to alter effective draw down or maturity dates).

From this comparison it is apparent that much the same functions are being performed in off-balance sheet banking as in traditional banking, and moreover for reasons which are essentially the same as those explaining traditional intermediation by banks. Guarantees exploit opportunities arising from information asymmetries, where the bank has access to information about a borrower's 'real' credit risk and the risk premium which would otherwise be required by the market for certain borrowers is greater than the fees charged to them by banks (and other financial guarantee insurers). Access to the interbank market means that banks may also be better able to bear liquidity risk. Any interest rate risk under a revolving line of credit can also be ameliorated in various ways, including shifting risk onto future markets.

Clearly banks possess skills in acquiring information and can tap wholesale funding markets which enable them to issue guarantees and write commitments of various kinds. One motive to do so is the fee income generated from taking on the risks. Another reason, apparent from Table 1, is that off-balance sheet activities and associated risks enable banks to achieve dramatic increases in leverage — as measured by conventional balance sheet quantities. Such activities can enable banks to escape regulatory barriers to increased leverage imposed by deposit insurers and prudential supervisors, thwarting limitations upon bank risk exposure. They also enable banks to avoid the regulatory taxes which stem from reserve requirements and deposit insurance levies, and pass on the cost savings to customers in terms of the lower

FIGURE 1

COMPARISON OF ON AND OFF BALANCE SHEET BANKING



'spreads' which come from routing deposit and loan business off-balance sheet. Here we have the 'moral hazard' and 'regulatory tax' hypotheses discussed earlier.

But if it has always been open to banks to convert on-balance sheet intermediation into off-balance sheet equivalents, the question arises as to why the great growth in this activity occurred in the 1980s and not in earlier years.

4. Reasons for the growth of off-balance sheet operations

To some extent the premise in the question above can be queried. 'Securitisation' is a trend which has been discussed much in recent years. It refers both to the switch away from bank intermediation to direct financing via capital markets, and to the transformation of previously illiquid assets like loans into marketable instruments (Gardener, 1986). Yet to the extent that securitisation has taken the form of bills of exchange and similar instruments, then it is little more than a rediscovery of financing forms well known to our grandfathers.

There are now about 1,450 rated programmes in the US commercial paper market. This represents a strong growth from the 700 odd companies issuing commercial paper in 1974 and the 327 commercial paper issuers in 1960. Again the base for comparison is important. The US commercial paper market is one of the oldest of US money markets, with a history stretching back to the middle of the nineteenth century. Commercial paper and bankers acceptances were the main instruments of the New York money market in the 1920s. Indeed in 1920 there were 4,395 issuers of commercial paper and outstandings amounted to $ 1,296 million. After 1930, both issuers and outstandings declined sharply. By 1933 there were 548 issuers and outstandings had shrunk to $ 60 million. Even by 1960, outstanding paper placed through dealers at $ 1,159 million was below 1920 levels in nominal terms.

Securitisation is also remarked upon in the context of international financing, and the switch away from bank lending. During 1987, international bond issues were $ 175,6 billion, Euronote facilities arranged amounted to $ 70.2 billion, whereas new syndicated Eurocurrency and foreign bank loans amounted to $ 87.9 billion. By contrast, in 1981 syndicated bank loans ($ 131.5 billion) were over two times greater than issues of Eurobonds and Euronotes (of $ 52.8 billion). That was the relative position which had ruled for all of the previous decade. One has to be back to 1972 to find a year in which Eurobond issues roughly equalled in amount new syndicated lending by Eurobanks. Again, if one goes back further to the nineteenth century, it was more usual for the great bulk of international financing to occur by means of security flotations. Many, incidentally, were placed like Eurobonds are today, in a number of international centres rather than in one securities exchange.

These comparisons help us to keep current developments in context. Nevertheless there is much that is new in present trends and the change from earlier decades is sufficiently abrupt to warrant explanation, which we do under four headings:

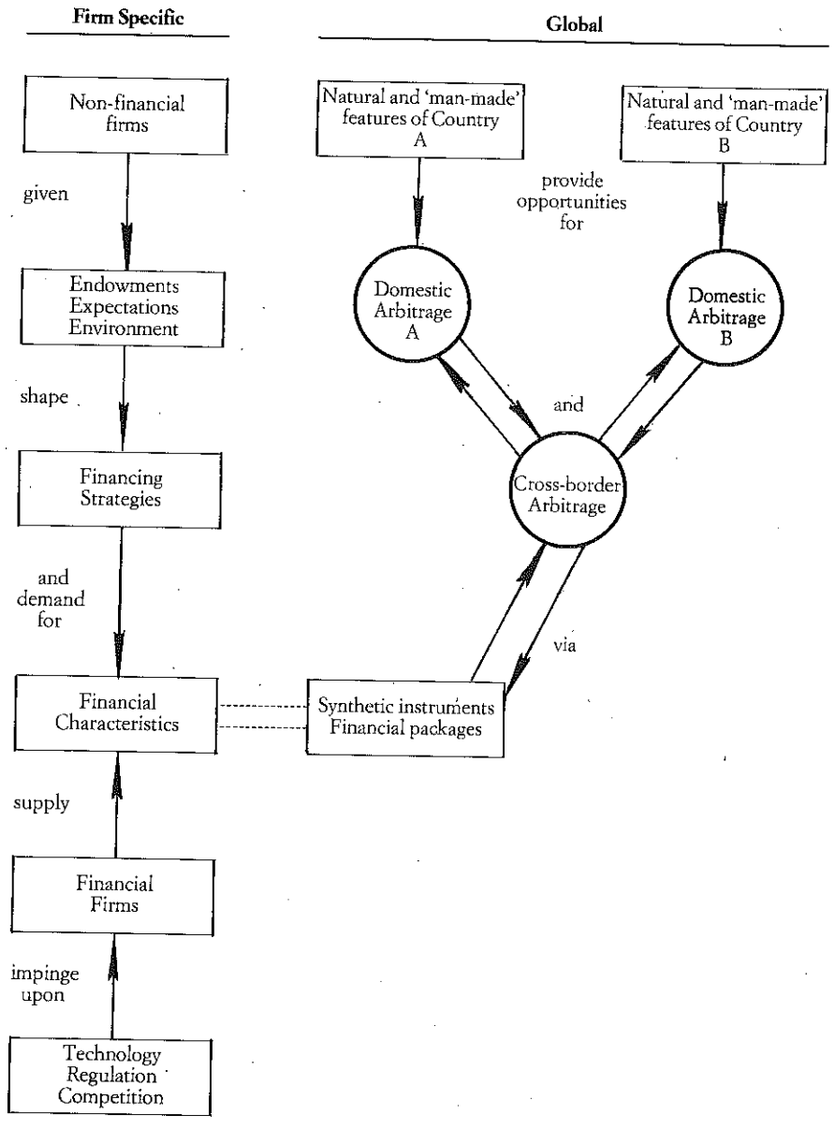
a) altered conditions in banking markets;
b) changes in the economic and financial environment;
c) arbitrage opportunities in capital markets;
d) developments in financial technology.

Figure 2 provides a framework which encompasses the points raised in terms of both 'firm specific' and 'global' factors prompting innovations in financial techniques.[6]

[6] Preparation of the Figure was greatly aided by reading BIS (1986) and FRANKEL and MANN (1986).

FIGURE 2

A FRAMEWORK FOR ANALYZING INNOVATIONS IN FINANCIAL TECHNIQUES



Conditions in banking markets

Demand for the intermediation services of banks depends both on the underlying distribution of wealth and the liquidity and risk preferences of wealthholders. During the 1970s, both factors favoured bank intermediation. Many commentators have depicted the financial behaviour of OPEC countries, especially in the initial years of high surplus, as cautious, with a desire to hold funds in instruments having a high degree of liquidity. At the same time, the desire of developing countries to continue investment programmes by medium-term funding presented the banks with a ready-made opportunity to intermediate the wealth transfer process.

The pattern of current account deficits and surpluses has altered dramatically in the mid 1980s, with capital flows running in the main between industrial countries. Japanese and German lenders prefer to acquire securities and other claims issued directly by the United States, so that the wealth transfer process has reverted to more 'traditional' channels.

On the supply side, those banks that engaged in international banking during the 1970s were able to meet the demand for intermediation services by expanding their balance sheets. Profitability in banking was high, enabling bank capital to be generated from internal resources.[7] Loan losses on both domestic and overseas business were low, which encouraged banks to run down capital reserve ratios to very low levels, so levering up their loan business and earnings relative to capital holdings. Banks were also able to sustain international lending by pulling in a steady stream of banks fresh to the international scene. The opportunity which was thereby presented for risk diversification kept the margins for risk, and thus required spreads, low.

Here again matters have changed. For the moment, at least, it would seem that the process of international portfolio diversification by banks has run its course; while those engaged in international lending are constrained by the need to build up loan loss provisions. As capital adequacy and perceived credit risks has grown, many banks are monitoring ongoing exposures more carefully, adding to costs of 'traditional' international bank deposit and lending business. During the 1980s, depositors have undoubtedly revised their perceptions of the relative quality of bank-issued liabilities *vis-à-vis* bonds and notes issued

[7] This is argued clearly by CONGDON (1986).

by highly rated government and corporate borrowers: whether in the wake of October 1987 we shall now see some broad swing back remains to be seen. But it has been the case that, because of lenders' changed preferences, the banks' best borrowers have found that they can issue paper on better terms than they are able to obtain on bank loans.

Most bank customers do not have stand alone access to capital markets and their desire to tap financing on the cheapest terms has overlapped with banks' willingness to obtain income without the commitment of additional capital resources. Banks complement and assist the workings of securities markets by leasing out to market participants for a fee their superior credit standing, access to liquidity support facilities and transactions infrastructure. Banks aid their customers' access to securities markets in other ways. A warehoused interest rate swap, in which a low rated borrower takes out a floating rate loan and exchanges the interest rate payments with a higher rated borrower issuing a fixed rate Eurobond, creates a *synthetic instrument* giving fixed rate funding for the customer. Since the higher-rated firm acts as a surrogate borrower for the lower-rated borrower, middle-ranking firms gain access to the international capital markets through the agency of the bank. The same effect is achieved when banks sell on to other banks participations in loans to middle-ranking firms which have been 'stripped' into short-term maturities, so creating what is, in effect, an informal syndicated interbank commercial paper market.

As compared with banking intermediation, markets are inflexible since trading is most efficient when deals are struck using standardised quantities of funds for delivery over set periods of time. Banks' advantage as financiers has been their willingness to fashion customised financial packages for customers. Much of the pressure to provide such packages off-balance sheet can be traced to changes in the economic and financial environment in the late 1970s and 1980s.

Changed economic and financial environment

The breakdown of the Bretton Woods system and the switch to floating exchange rates has created a demand amongst the customers of banks for the hedging of exchange rate risks on a routine basis, while the transition from low and stable inflation and interest rates to high and variable inflation and interest rates increased the need for firms to hedge their potential interest rate exposures.

A firm's hedging strategy will depend upon a number of considerations in addition to the environment as depicted on the left hand side of Figure 2: its 'endowments', *i.e.* physical assets, production and revenue structure, and financial contracts; its expectations and tolerance of volatility in returns, and the transactions costs of purchasing the various hedging instruments. Banks reduce the transactions costs facing firms by acting as brokers (or in some cases dealers) for the exchange-traded futures and option contracts. They offer 'over-the-counter' forward and option contracts which can be tailor-made to customer requirements, and in so doing act as 'size intermediaries' between the retail and wholesale markets for hedging instruments.

Over-the-counter packages have widened the hedging options available to banks' customers both in terms of the range of instruments and the length of time over which hedging can occur. Hedging of foreign exchange risks, for example, has traditionally taken the form of offsetting spot transactions and forward exchange contracts, along with financing instruments such as bills and bankers' acceptances. From these 'first generation' products evolved the second generation of Treasury products in the form of exchange-traded futures and options, over-the-counter futures (*e.g.* forward rate agreements) and options. Options could be written in series of puts (interest rate caps), series of calls (floors) and combinations of calls and puts (collars). A third generation of Treasury products combines features of the first and second generation products. For example, a break-forward is a conventional forward contract on to which is welded a currency option.

These hedging instruments have active two-way markets for maturities out to 12 months in most currencies, but the market beyond 12 months, and certainly outside two years, is thin. Cross-currency swaps take over as hedge instruments where long-dated foreign exchange covering tails off. Participants in the swap market generally regard a fixed-to-fixed cross-currency swap as more akin to the long-dated forward foreign exchange market. Because of this similarity, cross-currency swaps can be seen to allow longer maturities, larger transaction size and greater flexibility than is customary when hedging via the foreign exchange markets.[8]

[8] The similarities and differences between foreign exchange swaps and the newer cross-currency swaps are examined in HENDERSON and PRICE (1986) and REDHEAD (1986).

Arbitrage opportunities in capital markets

Securities markets can be seen to be passing through a process of 'globalisation' which occurred in banking 20 years ago. Banking markets in different countries (and currencies) were then separated by exchange controls, reserve ratios, banking laws and regulations and interest rate controls. These differences created opportunities for banks in the Euromarkets. A near perfect market was established between the various Eurocurrencies, and the diversion of domestic business to them led eventually to pressures for the controls to be lifted or their incidence lightened. In the process, there has been created effectively one international short-term money market.

Barriers separating securities markets can be thought of as two types: 'natural' and 'man-made'. Natural barriers arise from the costs of effecting financial transactions, the different information which parties possess and their risk and liquidity preferences. These have long been supplemented by 'man-made' ones. National authorities have long sought to control access by foreign borrowers to the longer term domestic capital markets by documentation rules, queues, notification procedures, controls on the conversion of a domestic currency into foreign currencies, ownership restrictions on equity holdings, withholding taxes on interest income, inability to issue bearer securities, and so on. These have encouraged the growth of Eurobonds, issued largely free of these restrictions. The decline of foreign bond issues in favour of Eurobonds has seen the removal of many of the restrictions, such as occurred earlier in banking markets. Nevertheless, this process is far from complete, leaving arbitrage opportunities which are exploited by banks (depicted on the right hand side of Figure 2).

What is intriguing is the innovative way in which the regulatory structures are being pierced and the natural barriers lowered. One method is that of surrogate borrowing through cross-currency swaps. In a cross-currency swap the counter-parties exchange interest payments in one currency for interest payments in another currency. These exchanges work on the principle of the 'gains from trade'. Each party raises funds on the market in which it has a comparative advantage, and then trades with the assistance of an intermediary. A cross-currency swap may be due to differences in borrowers' risk assessment in markets for fund raising in different currencies. For instance, a US firm wanting DM funding, but unknown in the German capital market, and a German firm seeking US dollar borrowings but little known in the US can each borrow in their

home currency and 'swap' the interest and principal at an agreed exchange rate. Or, a German bank may act as a surrogate borrower, say, for an Australian firm in Australian dollars on the Eurobond market. In this way, as two writers[9] put it, 'a wider audience has emerged for capital market products denominated in what were up-to-now "exotic" currencies'.

One of the methods used by banks to widen banking markets in different currencies was (indeed still is) the manufacture of synthetic deposit and loan instruments. Some Eurocurrency markets are essentially 'satellite' markets with a shortage of market makers in the particular currency. Thus a bank in Paris or Brussels receiving a Eurosterling deposit has usually not sought to find a sterling borrower, nor to increase working balances in London. Rather, it has sold £ spot, held the funds in US $, and covered forward. Similarly, a bank which is requested to supply a Eurosterling loan 'manufactures' the currency by borrowing US$ and 'swapping', that is, buying £ spot and selling forward. Eurosterling can always be created in this way, independently of funds from the domestic market.

Securities markets can be manufactured along much the same lines. In the absence of a DM commercial paper market, for instance, German companies can issue US dollar commercial paper, sell the proceeds for DM and cover in the forward market. This creates the equivalent of DM commercial paper. The US dollar commercial paper could be issued on the US domestic market, on the basis of a bank guarantee, or on the Euro-commercial paper market. Construction of a synthetic market can serve as a substitute for an actual market or, if an on-shore market exists, ensure thay any controls imposed upon it are arbitraged away (Levich, 1986).

Technology

The example given in the preceding paragraph can be generalised across a broad range of financial transactions, all made possible or at least less costly to construct by virtue of advances in computer technology. Drawing on the insight that Lancaster (1966) made of physical products, financial claims can be regarded as packaging

[9] FRANKEL and MANN (1986).

together a number of financial characteristics. A ten year fixed rate Eurobond is a package of a particular interest rate structure (fixed rate), a specific currency (US dollars), and a certain maturity (10 years). Any of these attributes can be unpackaged and traded separately from the others. Either at the time of purchase or later, the holder could exchange the fixed interest-rate rate stream for floating, the US dollar payments for another currency, keeping only the term to maturity. Alternatively, the bond could be maturity 'stripped' and sold off as a sequence of short-term instruments.

Here we have an illustration on the fungibility of financial products. Once physical products are produced, the characteristics can be altered only by trading the asset itself or by transforming it in production. By contrast the characteristics of financial products can themselves now be unbundled and separately traded. These exchanges can be made without having to re-negotiate either the original instrument or its covenants. Such financial engineering has always been possible. Modern computer technology has brought the cost of doing so within reasonable bounds.

As another example of the impact of technology, financial services in the past have usually been fully integrated vertically within particular financial firms. Banks and savings institutions have initiated contact with the customer, made the loan, collected repayments and carried the asset. These services can be vertically 'de-integrated'. In some packages in the US, origination is separated from the lending of funds, other parties insure the loans, still others do the loan packaging, with different firms holding the loans as trustees for the securities issue, while the servicing of customer repayments is handled by another institution.

One reason for 'unbundling' is to allow institutions to sell off part of their portfolio and buy in participations in other assets, so obtaining a better spread of risks for a given balance sheet scale. Another is to allow institutions to best exploit their comparative advantages. Banks' comparative advantage may be in terms of their ability to assess credit risk and make informed selections of loans. Given the 'regulatory taxes' imposed upon them and the current pressures upon their capital resources, they may not be the best institutions to fund and hold the assets. An arrangement by which banks originate loans and shift them off-balance sheet to other institutions may be superior to one in which the institutions which hold the assets also make the credit assessments. Guarantees which back customers' issue of securities for other institutions to hold, underwriting of securities issues and revolving underwriting commitments are also means of bringing about such a preferred division of labour.

5. Risks of off-balance sheet operations

Regulatory authorities have taken an active interest in the off-balance sheet activities of banks for obvious reasons. While the growth of this type of banking has been prompted by an interaction of a number of factors, one important element in the story is the attempt by banks to circumvent the application of capital adequacy constraints by boosting income from sources which are as yet largely free from capital requirements. As insurers of last resort, authorities are worried that they may be called upon to pick up some of the downside risk of these activities. When offering back-up credit lines, banks may be trading on their privileged access to liquidity support facilities provided by the central banks, which must in turn ensure either that the facilities are priced adequately or are made open to other market participants.

The risks can be grouped under four headings.

a) *Operational risks*. Most of the financial services listed on the right hand side of Table 2 give rise to the possibility of trading losses and legal claims which can rebound on to the bank. However, the major risk is in terms of a bank's reputation, and this is true also of securities underwriting, the advice given to customers when using hedging and 'synthetic' strategies, and the expanding market for asset sales without recourse.[10]

b) *Funding (liquidity) risks*. These arise when a bank is unable to obtain the funds needed to meet obligations when they fall due. A bank may have to pay out funds before it receives proceeds from the counterparties (settlements risk) and customers can exercise their options to draw upon credit lines and other liquidity back-up facilities. Banks in turn must utilise their options to issue liabilities, borrow interbank, sell off assets, or draw upon official liquidity support facilities. Extensive use of these funding options may push up the cost of funds to a bank and, in the limiting case, trigger a loss of confidence in the institution.

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[10] GORDON and HAUBRICH (1987), BECKETTI and MORRIS (1987).

c) *Position risks*. Banks are exposed to an erosion of anticipated income due to adverse interest rate and exchange rate movements on a large number of activities, ranging from revolving credit lines and most of the swap and hedging instruments through to securities underwriting. In the case of the swap and hedge contracts, banks' risks come from positions left open deliberately to benefit from expected market trends, their roles as counterparties when conducting their own hedges, from 'warehousing' activities and from the difficulty of constructing adequate cross-hedges (which normally leaves a basis risk).

d) *Credit risks*. They come about when customers whose performance is guaranteed fail to deliver and from the default of counterparties in intermediated transactions. Banks acquire a substandard asset in the form of an enforced loan, control of collateral, or over goods under contract which must be disposed of, or the cost of unwinding or offsetting a market position.

So far regulators have focused most attention upon credit risks. When assessing these it must be emphasised that many of the items 'below the line' have a probabilistic element, like the on-balance sheet items. In the same way that the option held by an individual depositor to withdraw deposits may not be exercised, the contingent liability of an unused overdraft line may never involve any actual on-balance sheet nsequences: the holder of the limit may not draw upon it. In both of these cases, banks have offered these options for many years and can calculate the probabilities of their usage with some degree of accuracy. For most of the swap and hedging instruments, their very novelty is a problem, while some are so complex that considerable technical skills are needed to understand them and quantify the risks. In the case of some instruments, there is previous experience available, but recent developments make it of dubious value. For example, a survey conducted by the Federal Reserve in 1978 found a loss rate on standby letters of credit of 0.04 per cent, well below the charge-off rate of 0.41 per cent for loans in the same sample.[11] But the extension of standbys to lower-rated companies since then may have altered the position. In the face of these difficulties, regulators have fallen back upon a largely functional approach which scores off-balance instruments in terms of loan equivalents and this forms the basis of the 'Basle Agreement' of G-10 Countries and Luxembourg, which builds on the earlier UK-US "Accord".[12]

[11] CHESSEN (1986).
[12] *Quarterly Review,* Federal Reserve Bank of New York, Winter 1987-88

In all such supervisory proposals, a trade off must be struck between two objectives. On the one hand, the application of requirements which are in excess of amounts that banks would want themselves to maintain on prudential grounds, raises the cost of doing business. The proposal consequently runs the risk of penalising the ability of banks to compete for off-balance sheet business in competition with, say, financial guarantee insurers (Hirtle, 1987). Alternatively, certain instruments, *e.g.* swaps, may be rendered less cost effective to the end user. On the other hand, many institutions tend to treat minimum capital guidelines as maximum amounts, on the grounds that an adequate holding of capital is one maintained at the same level as that of other banks in a similar situation. The authorities must thereby ensure that minimum ratios are sufficient to cover the likely risks, and so maintain an element of 'co-insurance' of banking risks with bank shareholders.

In terms of the other risks, the expansion of off-balance sheet banking has transformed the opportunity locus for banks in asset-liability management as much as it has for their customers. The broadening of the futures and options markets has lowered the costs of hedging risks by enabling risks to be shifted to other risk bearers. Interest rate risks are clearly less in an environment in which banks can unwind exposures quickly in the face of adverse trends by means of the creation of synthetic assets and liabilities. Liquidity management is obviously transformed when a large portion of banks' asset portfolios can be marketed. With the new technology, there exists the potential for banks to almost continuously mark many of their exposures to market and monitor the risks involved. And it is pertinent to observe that the major losses in banking in recent years have not been the result of new products and techniques but of doing traditional banking badly.

At a broader level, banking authorities are concerned about off-balance sheet banking as part of the trend to 'securitisation'. In particular, individuals and firms are beginning to assume risks carried in the past by specialist risk-bearing institutions, which acted as a buffer to the financial system. This development may make for a better overall allocation of risks in financial markets, but it also widens the potential ambit of financial shocks and indicates the desirability of continued cooperation amongst national supervisory authorities to regulate the global financial marketplace.

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