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INTEREST RATE FUTURES: AN INNOVATION IN FINANCIAL TECHNIQUES FOR THE MANAGEMENT OF RISK

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INTEREST RATE FUTURES: AN INNOVATION IN FINANCIAL TECHNIQUES FOR THE MANAGEMENT OF RISK[1]

Introduction

In recent years there has been a marked advance in the prominence and status of financial futures markets in the hierarchy of international money and capital markets. This development reflects the growing recognition by increasing numbers of economic agents, particularly financial institutions, of the rational basis for their own participation in financial futures markets. At the same time, in many quarters, questions continue to be raised about the rationale and justification of the proliferation of financial futures contracts and about whether, in fact, such markets mainly serve to provide opportunities for speculation. Those who take this view generally see recent innovations in financial techniques as having adversely affected economy-wide productivity growth. James Tobin has expressed such sentiments by admitting to "... an uneasy Physiocratic suspicion, perhaps unbecoming in an academic, that we are throwing more and more of our resources, including the cream of our youth, into financial activities remote from the production of goods and services, into activities that generate high private rewards disproportionate to their social productivity."[2]

Be that as it may, there can be no denying that interest rate movements have become much more volatile in recent years, and in consequence the interest rate risks associated with borrowing and lending activity are perceived to have greatly increased. It is not

[1] I am grateful to Alexandre Lamfalussy and Warren McClam for their advice and encouragement as well as comments on an earlier version of this paper. Helpful comments and criticisms from several other colleagues at the BIS as well as at various central banks are also acknowledged. Any errors of fact and interpretation remain, of course, my responsibility.

[2] James Tobin (1984): "On the efficiency of the financial system", Lloyds Bank Review, July.

surprising, therefore, that economic agents, in the natural course of their affairs, should seek to protect themselves from unwanted interest rate exposures, nor for that matter that other participants should find speculative interest. In this respect the markets that have sprung up to provide for these preferences and tendencies are not inherently different from other types of forward or futures markets.

The purpose of this paper is to describe and analyse this new development and to pose some of the questions it raises for the conduct of monetary policy, the supervision of financial institutions and the overall performance of financial markets.

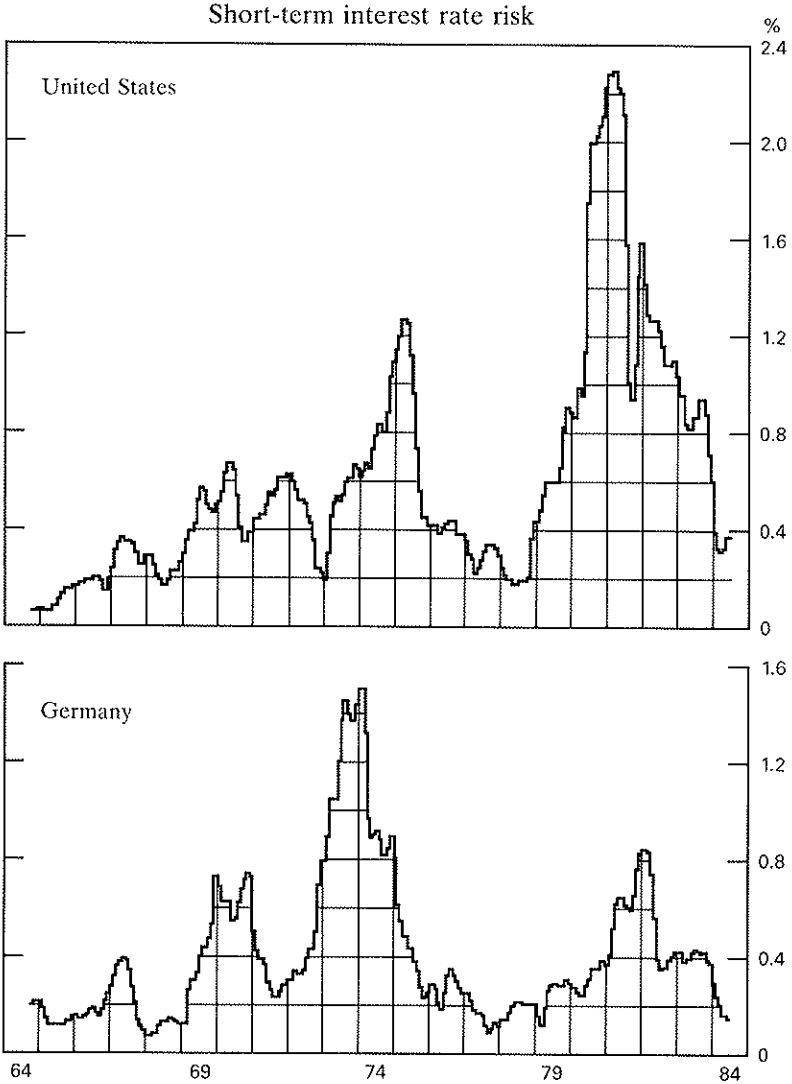
Heightened interest rate risks

Interest rate exposure can, of course, arise in a number of ways, as will be discussed subsequently. The aim of this section is rather to illustrate, by way of a simple example, the extent to which interest rate risks have changed over recent years. As can be seen from Graph 1, the measure in question shows quite similar results for the United States and Germany in the 1964–78 period and strikingly dissimilar results from then onwards. As a measure of short-term interest rate risk, it should be interpreted as indicating the unanticipated "cost" of interest rate risk exposure, i.e. the actual cost implicit in a mismatching of three and six-month maturities. Underlying this interpretation, of course, is the assumption, ex ante, that the term structure of rates reflects the prevailing state of interest rate expectations. Hence, the measure reflects, in effect, the difference between the realised behaviour of mismatched rates and that anticipated by the rate structure.

In turn, this suggests that the level of this measure and its movements provide an indicator, ex post, of the possible losses involved in a passive behaviour with respect to interest rate risk. It tends to mirror, therefore, the underlying development of incentives for the introduction of more efficient interest rate risk management techniques. This is because the creation of such facilities requires, in

Graph 1

Short-term interest rate risk



The short-term interest rate risk has been proxied by variations in the yield differential (annualised) between two consecutive three-month Euro-deposits and the corresponding six-month Euro-deposit, measured as the standard deviation over successive twelve-month periods.

effect, a capital investment expenditure decision to purchase the financial technology and begin the operation. If this is indeed the case, it would help to account for the recent greatly enhanced interest among participants in US dollar money markets, as opposed for example to those in Deutsche Mark money markets, in the adoption of new techniques of interest rate risk management. That is, both the level and the duration of the post-1978 surge in the US measure of interest rate risk strongly motivated costly reworkings of financial practices.

These new techniques are designed to transfer interest rate risk selectively to those more willing (or able) to bear it. In this regard, the major financial innovation has been the organisation of futures exchanges for the trading of interest rate futures contracts. The following discussion provides a description and assessment of the development of organised interest rate futures trading. To focus the discussion on banking and monetary issues, treatments of other financial futures contracts in foreign currencies and stock indices have been omitted.

Organisation of interest rate futures trading[3]

An interest rate futures contract is a fixed, standard agreement between a buyer and a seller for the delivery of a round lot of a specific financial instrument or its cash equivalent, such as a three-month, 1 million Euro-dollar time deposit, on a given future date at an agreed price. Although only a small proportion of traded interest rate futures contracts actually go to delivery, the possibility is important since it ensures the eventual convergence of the prices of the underlying financial instrument and the futures contract.

All trading in interest rate futures contracts must be executed on the trading floor of an exchange and the exchange must be provided

[3] For a comprehensive introduction to the mechanics of interest rate futures trading see Desmond M. Fitzgerald (1983): Financial futures, Euromoney publications, London.

with the details of each completed trade. The exchange is responsible for the instantaneous public dissemination of transaction prices and volumes. Thus, all market participants have continuous free access to current information. This method of trading is described as one of open outcry.

An important characteristic of a futures exchange is that, although each contract involves a buyer and a seller, their obligation is not to each other but to the clearing house of the exchange. The clearing house guarantees the performance of each of the settling clearing members of an exchange. This is in marked contrast to over-the-counter markets, such as the international interbank money market, where there are no facilities for the pooling of credit risks. Because of the absence of bilateral credit risk, the uniform futures contracts of each exchange are traded anonymously and, as a result, take on the attributes of specialised monetary assets.[4] Consequently, the direct search and transaction costs for futures market participation are usually much lower than those for alternative financial techniques.

The credibility of clearing houses' performance guarantees rests, in the first instance, on the system of margin requirements imposed on futures market participants. The clearing house administers the margin requirement regulations for the clearing members of the exchange. In turn, the clearing members administer the margin regulations for all other participants, including non-clearing members. Clearing and non-clearing members of an exchange can execute futures trades for themselves and their customers. However, all trades must be registered with, and eventually settled through, a clearing member. Both buyers and sellers of futures contracts have to put up initial margin (in cash, government securities or bank-provided letters of credit) to provide a cushion against adverse daily price movements of their outstanding (open) position in futures

[4] Lester G. Telser and Harlow N. Higinbotham (1977) have pointed out that the consequences of introducing an organised futures market and money, respectively, into an economy are very similar. See "Organised futures market: costs and benefits", Journal of Political Economy, October.

contracts. Every trader's futures account (including those of the clearing members) is adjusted daily to reflect profits and losses, and before the start of the next trading session every account either disburses or collects funds to complete the daily settlement process. The value of an open position in a futures contract returns to zero after each daily settlement. That is, there is a daily realisation of all gains and losses.

Secondly, credibility rests on the commitments of surviving clearing members to take on the settlement obligations of defaulting members. In turn, such commitments are buttressed by the minimum capital requirements and other obligations for clearing members of the exchanges.[5]

Illustrative applications of interest rate futures

The following are simple examples of possible applications of interest rate futures. Some of the technical limitations of using traded futures contracts to manage interest rate risk exposures are noted in later sections. Consider a manufacturing firm which foresees a need to borrow three months in the future to meet seasonal working capital requirements. In view of the risk of a possible rise in interest rates, the firm considers two hedging options as a means of "locking in" an interest rate. Firstly, it might sell short-term interest rate futures contracts. This transaction would lock in the firm's financing costs because the outcome of the futures market transaction, upon unwinding, would offset the realised change in interest costs. Alternatively, the firm could purchase a bank's commitment to provide it with a pre-set, fixed interest rate commercial loan. Having purchased such a commitment, the firm is

[5] For a thorough discussion of the operation and potential pitfalls of the margin requirement schemes of the various futures exchanges see Franklin R. Edwards (1983): "The clearing association in futures markets: guarantor and regulator", Journal of Futures Markets, winter.

not under an obligation to borrow and it would not do so if actual interest rates turned out to be lower than the commitment rate.

In turn, the bank might choose to hedge the cost of its loan commitment by selling interest rate futures contracts. The bank's anticipated profit would, if interest rates moved up, tend to equal the commitment fee since the gain in the futures market would be more or less offset by the higher level of interest rates. On the other hand, if interest rates fell, the bank might suffer a net loss on the arrangement because its loss in the futures market might be larger than the revenue from the commitment fee paid by the firm. Thus, it can be concluded that the commitment fee is equivalent to an insurance premium received by the bank to compensate it for possible losses on its futures market position.

Banks, securities dealers and other portfolio managers may find the futures market helpful in the management of their holdings of long-term fixed-interest securities. For example, an investment bank which deals in Euro-bonds needs an inventory of bonds on hand to be ready to service customers' purchase orders. However, in the event of concern about an increase in long-term interest rates, the dealer would sell bond futures contracts. Or a mortgage banker may, as a matter of course, sell long-term interest rate futures contracts over the period of time in which it is purchasing mortgages in anticipation of their sale as part of a large package of loans. Through this standardised hedge, the mortgage banker forgoes the possibility of additional profit (or loss) from general movements in long-term interest rates and is compensated only by the fees associated with assembling the package of mortgages for public sale.

Similar strategies for interest rate futures transactions would be available to investors who want to lock in rates on anticipated purchases of long-term securities. For instance, a pension fund may choose to lock in a yield on the investment of its projected receipts by purchasing interest rate futures contracts. This locked-in yield would be below what would have been the return if, contrary to the pension fund's expectations, interest rates moved up by the time contributions for investment were actually received.

Potential contribution

To understand the potential contribution of interest rate futures markets to financial systems, one must first examine the economic capabilities of futures contracts:

(i) to substitute for money and securities (cash) market transactions;

(ii) to change the relationship between measures of aggregate wealth and interest rates;

(iii) to insulate economic agents from changes in opportunity costs implied by changes in the level of interest rates; and

(iv) to affect the efficiency of underlying cash markets.

(i) For interest-bearing financial instruments, there is no futures contract whose economic characteristics cannot be approximately replicated in existing money and securities markets. Financial futures markets are used by economic agents because they offer lower search and transaction costs for the management of risk exposure through the use of standard (non-customised) types of contract. Futures exchanges organise trading in particular types of contract, such as the three-month Euro-dollar time deposit, only if it appears that the prospective trading volumes will generate sufficient commission income to justify the expenditure of real resources to develop and maintain trading in the contract. An implication of this requirement is that the specific kinds of traded futures contracts will be limited in number, since a proliferation of overlapping (closely substitutable) contracts will tend to raise the costs of the exchanges and futures market participants, including search costs. In fact, there are now only about ten types of actively traded interest rate futures contracts. In addition, for each of these contracts, the number of contract delivery months is limited to at most four per year, with trading in no contract extending beyond a three-year future delivery. Thus, interest rate futures markets have only limited capabilities for the hedging of the specific interest rate exposures of economic agents. Two examples may serve to illustrate this point. Firstly, consider a bank making loans based on the US commercial paper

interest rate, for which no corresponding futures contract is traded. Consequently, to protect its return in the face of an expected fall in the US commercial paper interest rate, the bank might purchase available futures contracts, such as the Euro-dollar time deposit. The effectiveness of such a hedge, assuming the coincidence of loan repricing and futures delivery dates, would depend on the change in the interest rate differential between the commercial paper and Euro-dollar rates. That is, by establishing a cross hedge of cash (commercial paper) and futures (Euro-dollar) market positions, the bank would be substituting a relative for an absolute interest rate risk exposure. Secondly, a borrower of a variable rate loan with an interest cost based on the three-month LIBOR interest rate. Available evidence suggests that the hedging efficiency of sales of a Euro-dollar futures contract for such a borrower deteriorates significantly when the loan repricing date and the subsequent Euro-dollar futures delivery date do not closely coincide.[6]

Furthermore, the results from opposite positions in futures and forward contracts (spreading) for the same asset and future delivery date will generally not be offsetting. Taking a long position in either type of contract commits one to buy the asset at a fixed price on a fixed future date. A position in a futures contract requires, *in addition,* the daily recognition of gains and losses. Riskless profitable arbitrage opportunities for opposite positions in interest rate futures and forward contracts require certain information on daily interest rate movements for the term to delivery of the contracts. Conversely, without certain information about the future course of interest rate movements, taking a spread position in futures and forward contracts cannot be a riskless arbitrage transaction.

Forward markets in financial instruments (other than for foreign exchange) are not well developed. Implicit forward interest rates,

[6] For a thorough discussion of the measurement of hedging efficiency see Patrick Parkinson (1982): "Estimating the hedging efficiency of Treasury bill futures: an alternative approach", International Finance Discussion Papers, Federal Reserve Board, No. 196, January.

however, are readily available to economic agents through cash market transactions. For example, the three-month Euro-dollar deposit interest rate in three months' time may be derived from the current market interest rates for three and six-month Euro-dollar deposits. Banks and other money market participants compare futures market and cash (implicit forward) market prices for interest rate contracts to discover trading opportunities, although it is understood by them that profits cannot be locked in.

From the above, it follows that the hedging efficiency of interest rate futures contracts for anticipated cash market transactions should be lower for the most distant future delivery dates. As an illustration, a bank would find it more risky to provide a more distant pre-set fixed-interest loan commitment than a near-term commitment, even if both commitments could be hedged through its purchase of interest rate futures contracts.[7]

(ii) Individual economic agents can change the relationship between the valuation of their financial holdings and interest rates by trading in interest rate futures contracts. However, the overall result of trading in interest futures can only be a re-allocation of interest rate risk exposure among economic agents. Such re-allocations could influence policy-makers' macro-economic policy choices because they might affect the relationship of changes in, and the level of, interest rates to the likelihood of failures of financial and non-financial firms.

(iii) Hedging interest rate risks through futures markets does not insulate participants from changes in interest rates once they have occurred. To illustrate this proposition, consider a firm that holds a goods inventory which is being financed by variable rate bank loans. By selling futures contracts, the firm protects (hedges) its inventory-financing costs against a possible rise in bank loan rates. Now

[7] Alternatively, since late 1982, the bank might purchase a traded put option on a debt instrument or interest rate futures contract to hedge a loan commitment. A put option is the right to sell a given amount at a given price on, or before, a given date. See Laurie S. Goodman (1983): "New options markets", Federal Reserve Bank of New York Quarterly Review, autumn.

suppose there is such an increase in these bank loan rates. The gain on the firm's futures position would enable it to finance its current inventory level as if interest rates had remained the same. But a profit-maximising firm would still want to reduce its future planned inventory levels in response to the now higher interest costs of inventory investment. Alternatively, the sales of futures contracts would preclude the firm from immediately profiting from an unanticipated decline in financing costs but not affect its incentive to add to its planned inventory holdings.

(iv) The performance of cash markets for debt instruments may be influenced by the introduction of interest rate futures markets, even though strong empirical conclusions about the significance of the introduction of financial futures on cash markets are difficult to draw owing to the problem of statistically controlling for changes in general market conditions. Nonetheless, empirical studies on interest rate futures trading have found that trading in these instruments has, on average, either helped to stabilise cash market prices or has had no effect on such stability.[8] In addition, it has been found that price changes for futures contracts in Euro-dollar and domestic US money market instruments exhibit contemporaneous behaviour, a relationship that has not been discovered for price changes in the underlying markets.[9] This finding is not surprising, given the low transaction cost of spread trading between interest rate futures contracts. Furthermore, it indicates that the establishment of futures markets in these money market instruments, by providing a low cost means of exchanging current money market information, has further tightened the integration of the US domestic and Euro-dollar money markets.

[8] For example, see Kenneth C. Froewiss (1978): "GNMA futures: stabilising or destabilising", Economic Review, Federal Reserve Bank of San Francisco, spring.

[9] Fred R. Koen, Billy P. Helms and Geoffrey G. Booth (1983): "The integration of Euro-dollar and US money market interest rates in the futures market", Weltwirtschaftliches Archiv.

Development of trading in interest rate futures

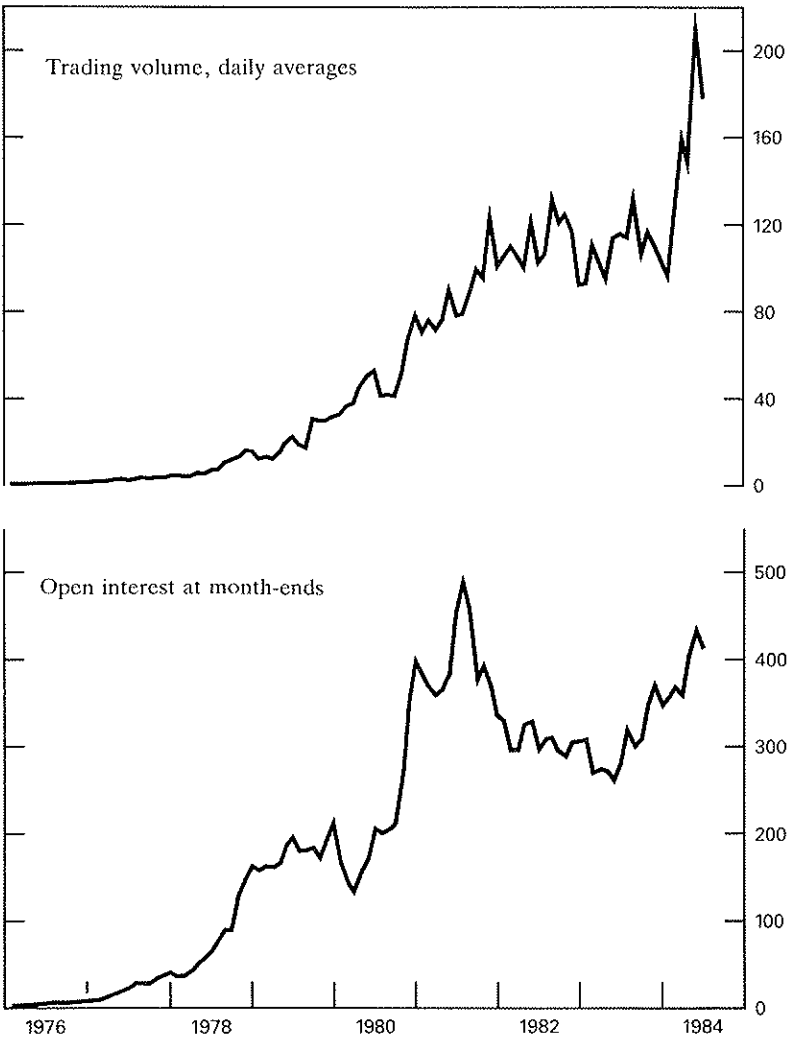
Trading in interest rate futures contracts for US dollar-denominated instruments was pioneered on the two Chicago commodity exchanges in the mid-1970s. Trading volumes on the two exchanges rose only modestly prior to the late 1970s. Since that time the volume of daily trading on these two exchanges has surged from less than 20,000 to more than 200,000 contracts, totalling more than $65 billion in face values (see Graph 2). The sharp increases in trading volumes for interest rate futures in the first half of 1984 reflect the greater divergence of opinion among market participants concerning the expected near-term movements of both long and short-term US interest rates and, possibly, heightened concerns about a continued smooth functioning of interbank money markets. Furthermore, it is interesting to note that the open interest total for interest rate futures (cumulative number of futures contracts which have been purchased and not yet offset by a futures contract sale, nor fulfilled by delivery) has not displayed a similarly strong upward trend. In fact, the total of open positions in interest rate futures was more than 15 per cent. below its mid-1981 peak at the end of the second quarter of 1984. Graphs 3 and 4 reveal that the fall-off was more than accounted for by reduced outstanding positions in long-term interest rate futures. Three-quarters of the $120 billion increase in the outstanding positions in short-term interest rate futures contracts over the three-year period was accounted for by the Euro-dollar time deposit contract. The Euro-dollar futures contract has been traded only since the end of 1981. As discussed below, it has become the major vehicle for commercial bank participation in the interest rate futures markets.

Interest rate futures markets in the United States outside Chicago have not been successful. In particular, the New York Futures Exchange (an affiliate of the New York Stock Exchange), which opened in 1980, failed to attract trading interest to any of four interest rate futures contracts. In addition, several efforts by the two Chicago exchanges to introduce futures trading in

Graph 2

Total trading activity in interest rate futures*

Number of contracts, in thousands

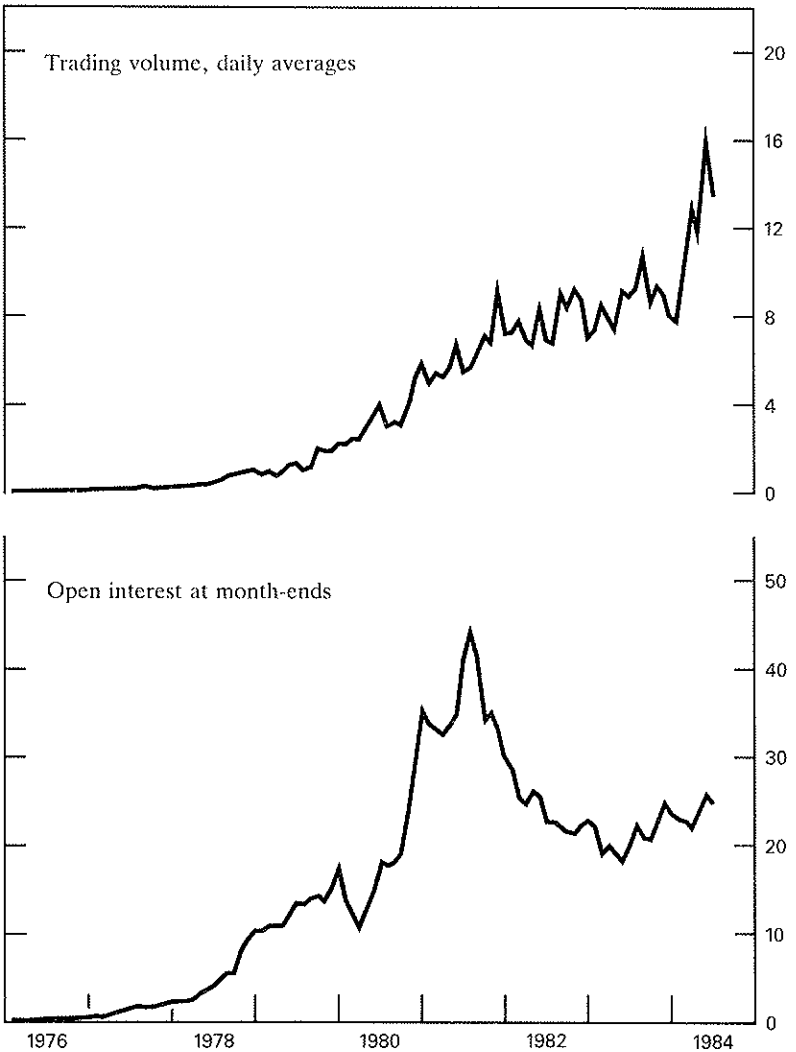


* Total of six interest rate futures contracts traded on the Chicago Board of Trade and the International Monetary Market of the Chicago Mercantile Exchange.

Graph 3

Trading activity in long-term interest rate futures*

Face value of contracts, in billions of dollars

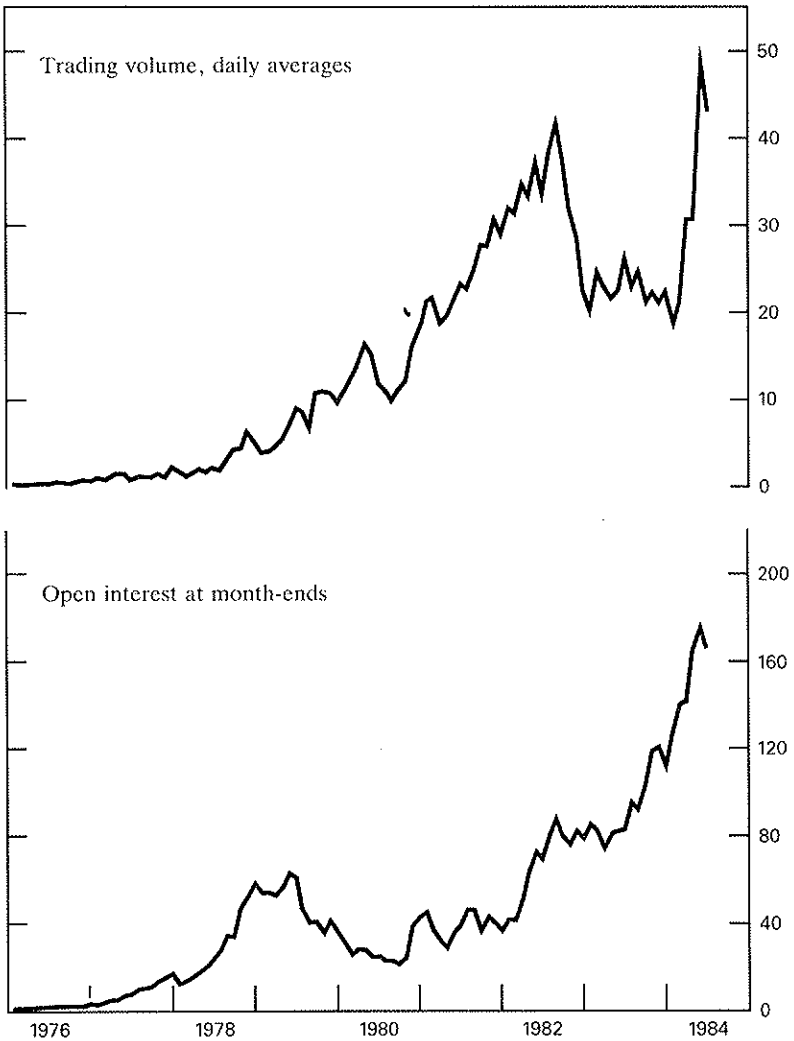


* Total of interest rate futures contracts: GNMA certificates (see page 19 for explanation), US Treasury bonds and US Treasury notes.

Graph 4

Trading activity in short-term interest rate futures*

Face value of contracts, in billions of dollars



* Total of interest rate futures contracts: US domestic certificates of deposit, Euro-dollar time deposits and US Treasury bills.

additional financial instruments, most notably commercial paper, were unsuccessful. These failures highlight the barriers to the proliferation of traded interest rate futures contracts erected by the low costs and ease of execution of trading in established liquid markets. Nonetheless, interest rate futures trading in US dollar and sterling-denominated financial instruments appears to have become fairly well established on the recently opened (1982) London International Financial Futures Exchange, with daily trading in mid-1984 of contracts totalling face values of $5 billion and $500 million in US dollar and sterling-based instruments respectively. Available evidence on trading volumes during the day suggests that the earlier-in-the-day trading hours of the London Exchange only partially account for its success.

Interest rate futures trading has also been organised on domestic exchanges for Australian and Canadian dollar financial instruments. A further expansion of Euro-dollar futures trading, including a mutual offset link (subject to approval by the US Commodity Futures Trading Commission) with the Chicago Mercantile Exchange, is scheduled for later in 1984 with the opening of the Singapore International Monetary Exchange. Under the arrangement, the clearing houses of the two exchanges would guarantee to each other the cross-border exposures of their respective clearing members.

Further expansion. Major securities exchanges in Germany, Japan and Switzerland have been exploring the feasibility of starting up interest rate futures trading denominated in Deutsche Mark, Japanese yen and Swiss francs respectively. In addition to other alternatives for interest risk management in these three currencies, direct interest rate futures contracts would compete with the combined trading of currency and interest rate futures on the established exchanges in Chicago and London.[10] The potential

[10] Available information indicates that futures market participants do not use financial futures contracts extensively to hedge non-dollar interest rate exposures. One reason given for this is the lack of reliable relationships between the movements of non-dollar Euro-currency interest rates and the domestic interest rates for these currencies.

organisers of these exchanges are aware that the commitment of capital to such organisation efforts is risky, given that the underlying demand of economic agents for specific financial exposure management techniques must be sufficient to justify the costs of organising and maintaining futures markets. In particular, there is a question about the need for, and viability of, interest rate futures markets for financial instruments denominated in currencies with historically stable interest rate environments. On the other hand, it is argued that even in these countries the sensitivity to interest rate risk has been considerably heightened in recent years. Furthermore, the start-up costs of new traded contracts has been lowered over time because of the growing pool of experienced traders in financial futures contracts.

Bank participation

Banks, after an extended period of little involvement, now participate actively in interest rate futures trading, primarily to manage their own money market and investment securities positions and, secondarily, on behalf of customers. It is of particular interest to note the progress of the internationalisation of bank use of futures markets. One indication of this process of internationalisation is that forty-seven non-US-based banks from fifteen countries had reportable open interest positions in one or more of the US interest futures contracts in 1983 (see Table 1).[11]

Data on open interest positions of commercial banks in interest rate futures contracts for end-1981, mid-1983 and May 1984 are shown in Tables 2a, 2b and 2c respectively. These three tables reveal the prominent rôle played by US and non-US-based banks in the very strong post-1981 growth of open interest positions in the short-

[11] The US Commodities Futures Trading Commission collects data on positions of large traders for surveillance purposes. The minimum reporting face values by type of contract are $50 million for Euro-dollar time deposits, domestic certificates of deposit and US Treasury bills; $15 million for US Treasury bonds; $10 million for GNMA certificates and $5 million for US Treasury notes.

Table 1
Commercial bank participation in US interest rate futures markets

Contracts	US-based banks	Non-US-based banks	Total
	Number of banks with a reported open position in 1983[1]		
Short-term			
Euro-dollar deposits	33	34 (15)	67
US Treasury bills	40	20 (8)	60
US domestic CDs	34	11 (9)	45
Long-term			
US Treasury bonds	35	19 (8)	54
GNMA certificates[2]	19	1 (1)	20
US Treasury notes	24	4 (2)	28
One or more of above contracts	64	47 (15)	111

Note: Numbers in parentheses are the number of countries in which banks are based. For example, 34 banks from 15 countries had reportable positions in Euro-dollar futures contracts.

[1] Based on data on open positions of traders above minimum reporting levels for each type of contract. [2] Government National Mortgage Association, an agency that approves the issue of mortgage-backed securities with repayment of principal and payment of interest guaranteed by the US Government.

Table 2a
Distribution of open interest positions in US interest rate futures contracts at end-1981

Contracts	Total face value of open positions	Distribution of open positions*					
		futures purchases			futures sales		
		commercial banks		all others	commercial banks		all others
		US-based	non-US-based		US-based	non-US-based	
	in billions of US dollars	as a percentage of total					
Euro-dollar deposits	1.5	22	0	78	7	8	85
US Treasury bills	30.1	4	0	96	7	1	92
US domestic CDs	4.7	11	1	88	4	0	96
US Treasury bonds	22.2	2	0	98	4	0	96
GNMA certificates	7.7	0	0	100	0	0	100

Note: Data for US Treasury notes contracts are not shown in this table because trading in such contracts did not start until May 1982.

* Based on data on open positions of traders above minimum reporting levels for each type of contract.

Table 2b
Distribution of open interest positions in US interest rate futures contracts at end-June 1983

Contracts	Total face value of open positions	Distribution of open positions*					
		futures purchases			futures sales		
		commercial banks		all others	commercial banks		all others
		US-based	non-US-based		US-based	non-US-based	
	in billions of US dollars	as a percentage of total					
Euro-dollar deposits	27.4	11	58	31	9	3	88
US Treasury bills . .	40.4	8	3	89	8	1	91
US domestic CDs . .	15.0	13	0	87	19	1	80
US Treasury bonds .	14.5	5	2	93	6	0	94
GNMA certificates .	4.5	5	0	95	3	0	97
US Treasury notes .	0.9	11	8	81	5	0	95

* Based on data on open positions of traders above minimum reporting levels for each type of contract.

Table 2c
Distribution of open interest positions in US interest rate futures contracts at end-June 1984

Contracts	Total face value of open positions	Distribution of open positions*					
		futures purchases			futures sales		
		commercial banks		all others	commercial banks		all others
		US-based	non-US-based		US-based	non-US-based	
	in billions of US dollars	as a percentage of total					
Euro-dollar deposits	89.3	22	37	41	21	1	78
US Treasury bills . .	47.5	9	3	88	9	1	90
US domestic CDs . .	29.4	15	1	84	16	1	83
US Treasury bonds .	19.1	5	0	95	6	0	94
GNMA certificates .	2.4	1	0	99	2	0	98
US Treasury notes .	3.2	3	0	97	8	0	92

* Based on data on open positions of traders above minimum reporting levels for each type of contract.

term interest rate futures contracts, most notably the Euro-dollar deposit contracts. A particularly strong 1983 surge in bank involvement in the interest rate futures markets undoubtedly contributed to the unusual stagnation experienced in 1983 by the interbank segment of the narrowly defined Euro-dollar (cash) market.

The persistence of very large net long positions (net purchases) in Euro-dollar futures contracts held by non-US-based banks has continued into 1984, rising by a further $11 billion to $33 billion in the year to the end of June. These large and growing open long positions are thought to be primarily accounted for by banks choosing to hedge the interest rate risk attached to their acceptance of term Euro-dollar deposits from customers through purchases of futures contracts rather than through interbank transactions. Overall, US and non-US banks have found it increasingly attractive to employ futures positions as well as interbank market positions to manage interest rate risk. Firstly, there have been reductions in commissions and improvements in the liquidity of interest rate futures markets. Secondly, futures positions are not reflected in banks' balance sheets, so that the use of futures reduces the constraints imposed on banks' position-adjusting by market and regulatory restraints on gearing.[12] To some observers, such preferential treatment of futures, as opposed to interbank, trading is justified by the smaller credit risks associated with the daily settlement procedures of organised futures exchanges, but others have cautioned against an undue reliance on the futures exchanges for the supervision of their clearing members' credit exposures. Nonetheless, it is clear that the use of futures markets by banks

[12] German banks are now exploring use of interest rate futures markets because of the scheduled introduction in 1985 of consolidated worldwide supervision. It is not yet clear whether the German authorities will interpret capital and foreign exchange maturity mismatch regulations to allow extensive use of interest rate futures trading by the banks to ease the burden of adjustment to consolidated supervision. For a discussion of those regulations and their possible application to financial futures trading by German banks see Herbert Barth (1984): "Financial futures: Neue Risiken für die Kreditinstitute?", Kredit und Kapital.

reduces the significance of a given value reported by a bank for a specific balance-sheet ratio.

To illustrate the above, consider the case where a bank has issued a one-year fixed-interest dollar deposit at the request of a customer. Because of the absence of available one-year fixed-interest assets, the bank initially places the proceeds of the deposit as a three-month Euro-dollar interbank placement. To close the maturity mismatch of its dollar asset and liability positions, the bank might (a) offer through a money market broker to make a one-year placement and, once such an offer was accepted, to finance it with a three-month interbank deposit; or (b) purchase interest rate futures contracts. Option (a), as compared to option (b), would use more of the bank's scarce capital-based credit capacity and require it to make a credit judgement about the recipient of funds. However, it is likely that option (a) may provide a more effective method for the bank's hedging of its specific interest rate risk exposure. Option (b) might be chosen by a bank which is seeking to bolster its net liquid reserves position.

Policy issues raised by futures markets

The emergence of markets for financial futures has raised a number of policy issues: firstly, the effect such contracts might have on the operation of monetary transmission mechanisms; secondly, the impact of financial futures markets on the soundness of financial systems; and thirdly, the effect of futures trading on the overall performance of financial markets.

Monetary policy. The spreading of futures market participation and contracts could significantly affect, as other financial innovations have done, the definition and measurement of the various broad monetary and credit aggregates. This is because the management of futures market positions and of portfolios of monetary assets are two techniques by which economic agents can adjust their economic exposures to anticipated interest rate

movements. However, there seems little basis for concern about futures-related distortions of the narrow measures of money. It has also been argued that the availability of interest rate futures may allow traditionally interest-sensitive economic sectors to insulate themselves from fluctuations in interest rates and, therefore, reduce the overall potency of monetary policy. However, as noted above, this argument has little foundation since futures do not change the opportunity costs of different activities.

Soundness. Financial futures reduce the cost of taking positions, but their availability does not bias an economic agent's choice in favour of assuming either more or less interest rate risk. Nonetheless, the introduction of interest rate futures has prompted concern about the adequacy of disclosure of interest rate exposure by financial reporting. In particular, bank supervisors are now addressing the problem of how to take into account a bank's position in interest rate futures when measuring its overall interest rate exposure.

Overall performance of financial markets. To the extent that financial futures markets contribute to a reduction of resources devoted to interest risk management, their use lowers the total resource costs of financial markets and, thereby, potentially improves economy-wide productivity growth. The acceptance of the premise that financial futures improve the efficiency of financial markets has led to recommendations that various legal and regulatory restrictions on the use of futures, such as those applied by US state regulatory agencies to insurance companies, be removed. However, the premise is not universally accepted and some have questioned the value of the ballooning quantities and varieties of financial exchanges. Such "uneasy Physiocratic suspicions" about the social value of new financial markets cannot be dismissed out of hand. Finally, it has been plausibly argued that one of the public costs of the availability of such management techniques is the weakening of incentives for economic agents to pressure monetary and fiscal authorities to conduct appropriate policies of their own.

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