
FRBSF WEEKLY LETTER

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Swaps

The pace of financial innovation in virtually all financial markets accelerated dramatically following the deregulation and decontrol of exchange rates and interest rates since the mid-seventies. Frequent and sizable fluctuations in financial prices, volatile inflation, and institutional constraints have encouraged market participants to seek profitable arbitrage opportunities, to speculate on future price movements, and to seek more efficient avenues in managing portfolio risk exposure. This *Weekly Letter* looks at two related financial innovations—interest rate and currency swaps, analyzes the reasons and motivations behind these transactions, and considers the regulatory implications.

A liability swap is an agreement between two or more parties—usually through a financial intermediary—to exchange or “swap” the obligation to make payments on debt instruments. The swap is made possible when these parties have opposite existing liability positions and/or financing needs, or when one party has a “comparative advantage” in borrowing from a specific capital market. When liability positions in a single currency are exchanged, the transaction is termed an “interest rate swap”. When two or more currencies are involved, it is termed a “currency swap.”

Two steps underlie all swap transactions. First, each party to the agreement initially secures (or already holds) a financial obligation that it does not necessarily wish to retain but for which it may have a comparative advantage in obtaining. Second, each party then swaps the (net) payments due on its obligation for those on the other's, whose payment stream it prefers. A central feature of most swaps is that they allow all or part of the underlying liability to be separated from its original payments structure.

There are three primary motivations behind swap arrangements. First, swaps allow both financial and non-financial institutions to efficiently manage portfolio risk arising from both interest rate and exchange rate volatility. Second, in many cases swaps allow institutions to lower financing costs of both fixed—and variable—interest rate debt by exploiting arbitrage opportunities across

various financial markets. Third, swaps are often arranged to provide institutions with either long-term financing or hedges in foreign currencies—long-term liquidity that often would not otherwise be available, or only available through a more costly alternative. These aspects are closely related and a swap transaction will typically involve elements of all three. For expositional purposes, it is nevertheless useful to distinguish the three motivations in the examples below.

Interest rate swaps

In its simplest form, an interest rate swap is an agreement between two parties for the exchange of a series of cash payments, one usually a payment on a fixed rate liability and the other a payment on a floating rate liability. For example, suppose a savings and loan association (S&L) has accumulated a portfolio with assets consisting of long-term fixed rate mortgages and funded those loans with liabilities in the form of six-month money market certificates. The maturity mismatch between the long-term fixed rate mortgage portfolio and the short-term liabilities used to fund it put this S&L at risk. A rise in interest rates increases cash payments for the money market certificates, but does not raise cash receipts from mortgages commensurately. An interest rate swap can reduce this risk.

A typical swap partner in this transaction is commonly a European bank (often acting on behalf of a corporate customer with funding needs the opposite of that of the S&L) who wants floating rate funding (i.e., make payments on a floating rate liability) in dollars. The S&L agrees to make fixed interest payments to the European bank, and the bank in turn agrees to make variable interest payments to the S&L. Both parties “swap” net interest payments on their underlying liabilities, although principal amounts are not exchanged and the interest rates paid each other on the fixed and variable rate payments streams are negotiated. Because of the swap, the S&L now makes fixed rate payments (to the European bank) on its obligations to match its fixed rate assets. Portfolio interest rate risk is correspondingly reduced.

Portfolio risk management is a major reason behind the development and rapid growth of the

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swap market. According to one source, commercial banks and investment banks last year put together interest rate swaps on an estimated \$70 billion of underlying debt, roughly three times the estimated 1983 volume. Equally important, however, are the potentially large interest savings on funding sources that both swapping parties can benefit from by using their relative advantage in generating funds in either the fixed or floating-interest rate markets. In fact, a common interest rate swap depends on "specialization" in borrowing and relative cost advantages: the financing arm of a highly rated (credit) industrial company uses its fixed rate borrowing capacity to save on floating-rate borrowing costs, and a lower rated industrial company—the usual counterparty in this type of swap—uses its comparative advantage in generating floating rate funds to save on fixed rate borrowing costs.

For example, suppose a low-rated company desires fixed rate long-term credit. This company presently has access to variable interest rate funds (e.g., through a revolving credit arrangement with a syndicate of banks) at a margin of $1\frac{1}{2}$ percent over the London Interbank Offer Rate (LIBOR), and its direct borrowing cost is 13 percent in the fixed rate public market (e.g., U.S. corporate bond market). In contrast, the financing arm of the high-rated company may have access to fixed rate funds in the Eurodollar bond market (low-rated companies, in contrast, typically do not have access to this market) at 11 percent, and variable rate funds at LIBOR + $\frac{1}{2}$ percent. Although the high-rated company has an "absolute" advantage in raising funds in both fixed and variable rate markets, the advantage is relatively greater in the fixed rate market.

A swap in this case would initially involve the high-rated company borrowing fixed rate funds at 11 percent in the Eurobond market and the low-rated company borrowing an identical amount of variable rate funds at $1\frac{1}{2}$ percent over LIBOR. The parties then swap the payments streams (but not principal amounts or the underlying obligation) and negotiate the cost savings. The low-rated company might negotiate to make fixed rate payments to the high-rated company at 11 percent (covering the Eurobond payments) and receive in return from the bank, variable rate payments at LIBOR. The indirect cost of fixed rate funds to the low-rated company from the swap is $12\frac{1}{2}$ percent (11 percent paid to service the

high-rated company's fixed rate debt and an additional $1\frac{1}{2}$ percent representing the difference between the LIBOR + $1\frac{1}{2}$ percent cost of its revolving credit line and the payment at LIBOR it receives from the high-rated company), a net $\frac{1}{2}$ percent saving from its 13 percent direct fixed rate borrowing cost. The high-rated company also gains. It receives floating rate funds on a net basis after the swap at LIBOR (1 percent below its direct borrowing cost).

In this example, it is likely that a commercial bank or investment bank familiar with the arbitrage opportunities in these markets can arrange both the initial financings of the two non-bank parties and the swap, save both parties interest costs on their preferred debt service flow, and reap a profit for arranging and often effectively guaranteeing the transaction by acting as the counterparty to each side of the transaction.

Currency swaps

Currency swaps may have all the features of interest rate swaps with two additional dimensions—the two debt service flows that are swapped are denominated in different currencies, and principal amounts are also usually exchanged. A U.S. corporation, for example, may want to secure fixed rate funds in German Marks (DM), at the cheapest possible cost, but is hampered in doing so because it is a relatively unknown credit in the German financial market. In contrast, a German corporation well-established in its own country may desire variable rate dollar financing but is relatively unknown in the U.S. financial market.

In such a case, a bank intermediary familiar with the funding needs and "comparative advantages" in borrowing of both companies may arrange a currency swap. The U.S. company borrows variable rate money in dollars (e.g., through a revolving credit arrangement with several U.S. banks) and the German company borrows fixed rate funds in DM. The two companies then swap *both* principal and interest rate payments. When the term of the swap matures, say, in 5 years, the principal amounts revert to the original holder.

In essence, the companies in this example are engaging in both a currency swap and an interest rate swap. Both exchange rate and interest rate risk can be managed in this manner, and at a cost-savings to both parties because they borrow initially in the market where they have a compara-

tive advantage and then swap for their preferred liability.

Currency swaps thus are often used to provide long-term financing in foreign currencies. This is an important function since, in many foreign countries, long-term capital and forward foreign exchange markets are notably absent or not well developed. Swaps are one vehicle providing liquidity to these markets.

These examples demonstrate that the basic principles behind interest rate and currency swaps are rather simple. However, variations of these basic themes are, in practice, often quite complicated. Innovative banking intermediaries often arrange swaps among several parties in several currencies and through different types of financial instruments. Moreover, international agencies, private parties and governments may be involved simultaneously.

Implications

Currency swaps have become a popular instrument for corporate treasurers to lower their funding costs and to manage portfolio interest rate and exchange rate risk. In terms of borrowing strategies, swaps allow corporations to achieve the lowest possible cost of financing because they can borrow in the market where they have a comparative advantage (regardless of their ultimate need for a specific currency or desire for fixed or variable rate financing) and then swap for the preferred liability.

Moreover, in terms of debt management, swaps allow corporations to "unfix" their debt structure: one debt obligation may be swapped for another, and perhaps swapped several times, depending on a corporate treasurer's views toward interest rates and exchange rates, and his attitude toward risk management. In this way, institutions can manage their portfolios more efficiently and at lower transactions costs.

Because interest rate and currency swaps often offer profitable arbitrage opportunities as well, they effectively serve as a bridge between fixed and floating rate capital markets on the one hand, and between domestic and foreign capital markets on the other. Economic theory suggests that the rapid proliferation of swaps will therefore serve to narrow the interest rate differentials between high- and low-rated credits across these markets.

Regulatory concerns

Hand-in-hand with the growth of the swap market is the increasingly prominent role played by banking intermediaries in arranging and guaranteeing the swap transactions. Most swaps in which a commercial bank is not directly a party are arranged by either commercial banks or investment banks standing in the middle as intermediaries. In this role, they receive and disperse interest payments and often guarantee the payments if one party defaults. If one party *does* default, those banks that do guarantee swaps are *not* obligated to pay off the principal amount of the debt (original creditors continue to shoulder primary default risk), but are responsible for the difference between their fixed rate receipts (payments) and variable rate payments (receipts), perhaps with amounts denominated in different currencies. Because interest rate and exchange rate movements can be large, this contingent liability could be substantial.

Some analysts, public officials and regulators of financial institutions have expressed concern over the growth of banks' contingent liabilities associated with swaps, and the small provisions for disclosing this risk exposure. Because contingent liabilities are "off balance sheet" items, they appear only as a footnote in the financial statement of a bank if accountants judge that this risk could materially affect the financial status of the institution. Moreover, there is usually no reference to this risk exposure in the quarterly call reports banks file with federal regulators. Banks are aware of the problem, however, and it is reported that many financial institutions are now arranging and guaranteeing swaps only when swap partners are willing to pledge collateral to back their part of the transaction. This limits the contingency risk of the intermediary bank.

Nonetheless, the rapid growth of swap transactions shows no signs of slowing. Swaps have proven an efficient and cost-effective means of diversifying portfolio risk and lowering financing costs. For banks, in addition, swaps have proved a profitable means to generate revenues both directly and in other business in related areas. Rapid growth is likely to continue as more parties become aware of the benefits offered by swaps. Regulators, in turn, must evaluate the risks that these off-balance sheet transactions present to both individual institutions and the broader financial system.

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Opinions expressed in this newsletter do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco, or of the Board of Governors of the Federal Reserve System.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 04/17/85	Change from 04/10/85	Change from 04/18/84	
			Dollar	Percent ⁷
Loans, Leases and Investments ^{1 2}	189,633	- 396	10,918	6.1
Loans and Leases ^{1 6}	171,961	- 189	12,872	8.0
Commercial and Industrial	52,241	- 313	4,284	8.9
Real estate	62,831	131	2,839	4.7
Loans to Individuals	33,581	253	6,049	21.9
Leases	5,347	- 15	353	7.0
U.S. Treasury and Agency Securities ²	10,744	- 252	- 1,482	- 12.1
Other Securities ²	6,927	43	- 473	- 6.3
Total Deposits	197,695	690	9,476	5.0
Demand Deposits	47,346	715	1,664	3.6
Demand Deposits Adjusted ³	31,268	17	1,263	4.2
Other Transaction Balances ⁴	14,532	391	1,572	12.1
Total Non-Transaction Balances ⁶	135,817	- 416	6,240	4.8
Money Market Deposit Accounts—Total	43,591	- 466	3,497	8.7
Time Deposits in Amounts of \$100,000 or more	38,630	- 116	849	2.2
Other Liabilities for Borrowed Money ⁵	20,797	- 108	1,747	9.1
Two Week Averages of Daily Figures	Period ended 04/08/85	Period ended 03/25/85		
Reserve Position, All Reporting Banks				
Excess Reserves (+)/Deficiency (-)	- 32	67		
Borrowings	123	36		
Net free reserves (+)/Net borrowed(-)	- 155	31		

¹ Includes loss reserves, unearned income, excludes interbank loans

² Excludes trading account securities

³ Excludes U.S. government and depository institution deposits and cash items

⁴ ATS, NOW, Super NOW and savings accounts with telephone transfers

⁵ Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources

⁶ Includes items not shown separately

⁷ Annualized percent change