

*an economic review by the Federal Reserve Bank of Chicago*

# Business Conditions

**YOUR SUBSCRIPTION EXPIRES IN 1975**  
Renewal information inside back cover

**International banking:  
Part I**

**Advertising for demand  
deposits**

**september  
1975**

# Contents

**International banking:  
Part I** **3**

*The overseas branch networks of U.S. banks grew at impressive rates in the 1965-75 period. As the banks acclimated themselves to serving customers at foreign locations they became increasingly adept at providing the full range of financial services.*

**Advertising for demand  
deposits** **10**

*An analysis of advertising expenditures sheds some light on one way banks attempt to attract demand deposits in view of legal restrictions on price competition.*

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# International banking: Part I

The past decade has witnessed profound changes in the international banking activities of U.S. banks as the industry has responded to the challenges and demands of a changing environment. This article traces these activities over the period. A second article, to appear in the subsequent issue of *Business Conditions*, will focus on activities of foreign banks in the United States.

## Expansion of branch networks: 1965-70

The position of the U.S. dollar in international finance, the continued expansion of international activities of U.S. corporations, the rapid growth of world trade, and the increasing internationalization of the world's capital and money markets presented the U.S. banking industry with new opportunities. However, the existing regulatory environment largely shaped the channels through which U.S. banks could respond. A set of programs restraining the outflow of funds from the United States, introduced by the U.S. Government in 1964-65 in an effort to shore up the country's balance-of-payments position, exerted a strong influence on the international activities of U.S. banks.

The federal government's capital control program consisted of the Foreign Direct Investment Program (FDIP), the Interest Equalization Tax (IET), and the Voluntary Foreign Credit Restraint (VFCR) program. Under FDIP, initiated as a voluntary program in 1964 and made mandatory in 1968, U.S. corporations were limited in the amount of funds that they could transfer to their corporate affiliates overseas. At the same time the foreign af-

filates were constrained as to the amount of locally generated earnings they could retain for reinvestment purposes. The IET, by imposing a tax on yields of securities of foreign origin, lowered the effective yield of such securities, making them less attractive to U.S. residents—and thus making it more difficult for foreigners (including the foreign affiliates of U.S. corporations) to finance their capital requirements in the U.S. market. Under the VFCR program, administered by the Federal Reserve Board, the head offices of U.S. banks were requested to limit their foreign lending to ceilings that reflected their historical foreign credit levels.<sup>1</sup> The program severely curtailed the capacity of home offices of U.S. banks to meet the overseas needs of their large corporate customers.

As a result of these restrictions U.S. corporations had to rely on external sources of funds to finance their growing investments abroad. To accommodate their corporate customers, U.S. banks established networks of foreign branches for purposes of tapping foreign sources of funds and setting up loan placement and service facilities. Given the nature of the impetus, the need and desire to expand abroad was not limited to the banks that traditionally engaged in an international banking business. Up to the early sixties only U.S. banks located in the coastal centers—primarily New York City, with some representation by Boston and San Francisco—operated overseas branches. What was especially notable about the rapid buildup of networks of foreign branches of U.S. banks in the period 1965-70 was that banks headquartered in such

<sup>1</sup>In November 1971 banks were provided with the option of adopting a ceiling related to their size.



cities as Chicago, Pittsburgh, Detroit, and other regional money centers entered foreign markets aggressively.

### Regulation Q

The government's capital restraint program was not the only factor that induced U.S. banks to establish and expand their foreign branch networks. Another regulatory barrier to the activities of U.S. banks in their home environment played an equally important role in inducing U.S. banks to establish a presence abroad.

The Federal Reserve System's Regulation Q places a limit on the rate of interest U.S. banks are allowed to pay on deposits received at their offices in the United States. In 1966 and again in 1969-70 as the level of U.S. interest rates rose due to the combined impact of a booming economy and an increasingly tight monetary policy, U.S. banks were restrained by Regulation Q ceilings from paying domestic depositors interest rates that could compete with the interest return from alternative financial instruments, such as U.S. Government Treasury bills and short-term unsecured promissory notes issued by large U.S. corporations (commercial paper). Banks experienced a run-off in deposits at domestic offices because of their inability to compete effectively for domestic funds. To supplement their traditional sources of funds, U.S. banks found it expedient to turn to their foreign branches that were not subject to interest rate ceilings and, thus, were free to compete for funds. Deposits taken in at overseas branches were transferred back to the United States for use by the domestic offices.

London branches, in particular, developed considerable capabilities in attracting U.S. dollar-denominated deposits (so-called Eurodollars)<sup>2</sup> because of the advan-

<sup>2</sup>Eurodollars are U.S. dollar-denominated deposits at a non-U.S. resident bank such as, for example, a London branch of a U.S. bank.

tages these international money-center establishments offered corporate as well as foreign governmental clients. The overlap in business hours between London and the Continent allowed readier access to dollar deposits located in London than at U.S. head offices. The vigorous competitive environment and the absence of reserve requirements resulted in London branches paying higher interest rates on dollar deposits than domestic U.S. offices or European banks paid on local currency deposits. Also, the branches could pay interest on dollar deposits with maturities less than 30 days—a practice prohibited to domestic offices under Regulation Q.

In addition, in 1966 the London branch of a New York bank introduced the negotiable Eurodollar certificate of deposit, a technique soon adopted by London branches of other U.S. banks. The introduction of negotiable Eurodollar certificates of deposit and the subsequent development of a secondary market for them is a classic example of a successful transfer of "financial technology" developed earlier by U.S. banks to meet the challenges of the domestic environment.

The bottom line result of the combined impact of the regulatory environment and of the internationalization of U.S. business activities was that the number of U.S. banks with foreign branches went from 11 in 1965 to 79 in 1970, and the number of foreign branches of U.S. banks rose dramatically from 180 to 532. The number of such branches in Continental Europe increased from 15 in 1965 to 66 in 1970. For the most part these branches were "downstream" facilities from London money-center branches, set up as loan placement and service facilities for large corporate customers. But branches also accepted deposits in the local currencies, thereby acquiring the funds needed for financing the local requirements of the affiliates of U.S. corporations.



## Overseas branches of U.S. member banks, 1965-75

(as of January 1)

Country of location	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium-Luxembourg	2	4	6	8	9	11	11	8	8	15	15
France	4	4	4	6	7	11	12	15	17	15	17
Germany	3	6	8	9	14	17	21	22	27	30	30
Greece	1	1	1	2	5	8	9	13	14	16	18
Italy	1	1	1	2	2	3	4	6	7	8	10
The Netherlands	3	3	3	3	5	7	7	7	6	6	6
Switzerland	1	1	2	3	3	6	7	8	8	9	9
United Kingdom	17	21	21	24	32	37	41	45	49	52	55
Total Europe <sup>1</sup>	32	43	48	59	80	103	116	128	142	157	167
Bahamas	2	3	3	3	8	32	60	73	94	91	80
Cayman Islands	—	—	—	—	—	—	—	—	2	32	44
Total Caribbean <sup>2</sup>	5	9	9	10	22	53	89	105	133	166	166
Argentina	16	17	17	25	33	38	38	38	38	38	37
Brazil	15	15	15	15	15	15	16	19	21	21	19
Columbia	5	6	6	8	17	23	26	28	28	32	36
Panama	10	12	15	19	21	26	29	29	32	33	33
Total Latin America <sup>3</sup>	78	88	102	133	177	235	281	296	322	356	363
China, Republic of Taiwan	—	2	2	2	2	2	2	2	3	5	7
Hong Kong	6	6	8	10	12	13	13	15	19	23	24
India	5	6	8	8	11	11	11	11	11	11	11
Indonesia	—	—	—	—	4	6	6	6	6	6	6
Japan	13	14	14	14	14	15	15	17	21	25	31
Lebanon	3	3	3	3	3	3	3	3	3	3	3
Persian Gulf <sup>4</sup>	2	2	3	3	3	3	8	11	10	10	11
Singapore	—	8	8	8	8	9	11	11	11	14	18
Total Asia <sup>5</sup>	45	55	63	69	78	83	90	97	109	122	138
Total Africa <sup>6</sup>	3	2	2	3	3	1	2	2	2	2	5
Overseas areas of U.S.	23	23	29	31	35	37	40	44	47	52	53
Grand total	180	211	244	295	373	460	532	577	627	699	732
U.S. member banks with overseas branches	11	13	13	15	26	53	79	91	107	125	125

<sup>1</sup>Also includes Austria, Ireland, Monaco, and Romania.<sup>2</sup>Also includes Barbados, Haiti, Jamaica, Netherlands Antilles, Trinidad-Tobago, British Virgin Islands, and other West Indies.<sup>3</sup>Also includes Bolivia, Chile,\* Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Paraguay, Peru, Uruguay, and Venezuela.<sup>4</sup>Includes Bahrain, Qatar, Saudi Arabia, and United Arab Emirates.<sup>5</sup>Also includes Brunei, Israel, Korea, Malaysia, Pakistan, Philippines, Thailand, and Vietnam.<sup>6</sup>Includes Liberia, Kenya, Mauritius, and Nigeria.\*

\*No resident U.S. branches as of January 1, 1975.



## Head office borrowing declines

By mid-1970 the incentive to establish overseas branches for the purpose of securing a deposit-taking facility not subject to Regulation Q was greatly diminished by two changes in the regulatory environment. First, effective September 1969, the Federal Reserve Board placed a 10 percent reserve requirement on any increase in the net liabilities of U.S. offices of member banks to their overseas branches. Second, effective June 1970, the Federal Reserve Board suspended Regulation Q ceilings on interest rates payable on large denomination certificates of deposits with maturities of 30 through 89 days.<sup>3</sup> In the wake of these changes U.S. banks did not show the same degree of interest in borrowing from their branches that they did in 1969—despite the reoccurrence of tight money conditions in 1973 and 1974. The effect of this diminished borrowing was that the considerable deposit-generating capabilities of the overseas branches, particularly those located in London, were now available to fund the lending activities of the branches. This change is put in dramatic perspective by the following numbers. At the end of 1969 about 40 percent of the \$33.7 billion in net assets (i.e., total assets less interbranch claims) of overseas branches represented claims on U.S. head offices. By contrast, in August 1974, the time of peak utilization of borrowings from branches by U.S. head offices during the period of domestic monetary tightness of 1973-74, only 5.7 percent of the net assets of overseas branches, totaling \$122 billion, were in the form of claims on head offices.

## Adaptation: 1970-73

Beginning in 1970, the overseas branch networks of U.S. banks found themselves in a situation where their own

<sup>3</sup>In May 1973 interest rate ceilings on large CDs maturing in 90 days or more were suspended.

funding capability, and the diminished requirements of their head offices, allowed them the leeway to initiate a more aggressive credit extension program. In part, their aggressiveness took the form of a willingness to accept a diminished net return on their loans. In part, the new aggressiveness took the form of innovations in lending techniques—for example, floating rate Eurocredits<sup>4</sup> and cash flow financing.<sup>5</sup>

The 1970-73 period also was one of considerable geographic diversification for U.S. banks with multibranch networks. The diversification created additional “one-stop” facilities for clients with either local currency needs or external currency needs. The advantage of the branch network in meeting the external currency requirements of clients of an individual branch can be described as follows: any branch in the network would be willing to provide funds to any other branch in the network at a preferred rate because it would not have to take into account the possibility of default. Besides allowing participation in additional banking

<sup>4</sup>The floating rate Eurocredit refers to the lending technique which involves tying the interest rate to an interbank deposit rate, e.g., the six-month London interbank offered rate. Depending upon the borrower's creditworthiness and other terms of the credit, a premium (or spread) is added to the interbank rate. In the 1970-73 period the maturity of the Eurocredit lengthened appreciably from a “normal” period of three to seven years to a “normal” period of ten to 12 years with at least one sizable Eurocredit being for 17 years. In addition, there was a considerable narrowing of the spread charged over the interbank rate. For prime borrowers in the developed countries, this meant a reduction from above 1 percent to a range between  $\frac{3}{4}$  percent and  $\frac{5}{8}$  percent. For prime borrowers in the less developed countries, this meant a reduction from a spread near 2 percent to a range between  $\frac{3}{4}$  percent and 1 percent.

<sup>5</sup>The use of cash flow financing represented a departure from the standard practice of asset-protection lending—i.e., the reliance on collateral security. For a discussion of cash-flow lending by U.S. banks overseas see Perry, George H. “Lending to Foreign Local Companies” in *Offshore Lending by U.S. Commercial Banks*, ed. F. John Mathis (Bankers' Association for Foreign Trade and Robert Morris Associates, 1975, pp. 133-150).



markets, the geographical diversification of branch locations enhanced the network's ability to generate commission income from financial advisory services—e.g., investment advisory services to multinational corporations, either U.S. or third-country based.

The number of U.S. bank branches located in Europe (outside the United Kingdom) increased from 66 to 105 in the 1970-73 period. In Asia, U.S. banks added 55 branches to the 83 that were in operation at the beginning of the period. The geographical dispersion of the additions to the branch networks is suggestive of a continuing effort at enhancing the downstream capabilities of the networks. In a related development U.S. banks sought special relationships with selected foreign banks, either via participation in jointly owned consortia banks or by the acquisition of shares in the foreign banks themselves. In a large number of cases the acquired interest was in a banking institution with a geographic expertise that the U.S. bank desired in order to compliment its own capability.

The expansion in the number of U.S. banks with overseas branches in the period 1970-73 was made possible by the Federal Reserve Board allowing a special type of foreign branch that became known as the "shell" branch.<sup>6</sup> The shell branch permitted smaller U.S. banks to establish a foreign domicile for the international portion of their corporate activities. This proved advantageous to the banks during the VFCR period. Following the termination of the VFCR program, the favorable tax treatment and the absence of reserve assessments against deposits booked at the shell branch continues to make this

<sup>6</sup>The special nature of shell branches derives from a provision in the letter from the Federal Reserve Board to a bank conveying approval of such a branch starting ". . . that there is to be no contact with the local public at the branch, and that its quarters, staff, and bookkeeping may, at least in part, be supplied under contract by another party."

form of branching attractive. At the end of 1974, of the 125 U.S. banks with overseas branches, 76 had but single branches located in the Caribbean, either in Nassau or the Cayman Islands. For these branches the credit activities of the shell are directed at interbank money market placements and purchases of small shares of syndicated loans.

Establishment of shell branches was not limited to small banks. Large banks also acquired shell branches. When the shell is a part of an extensive worldwide banking organization, credit activities of the shell are directed not only at interbank placements and purchases of loan shares but also at funding credits originated within the network.

#### **Expansion in head office activities: First half, 1974**

The termination of the VFCR program in January 1974 made possible a sharp increase in the level of foreign credits placed directly by U.S. bank offices (including U.S. offices of foreign banks). A large proportion of the \$11 billion placed in the first half of 1974—a 42 percent increase over the level of outstanding credits at the end of 1973—apparently took place in response to increased credit demand from the banks and/or trading companies of such oil-importing nations as Japan, Brazil, Mexico, and—to a lesser extent—some Western European countries. As banks of these countries drew on credit lines outstanding with U.S. banks, they chose domestic offices rather than overseas branches because of the slightly lower costs available in U.S. markets. Thus, the increase in loans to foreign banks during the first half of 1974 may have been a "one-shot" affair. In the nine months following June 30, 1974, loans to foreign banks fell by about \$2 billion despite a continuing positive differential between Eurodollar interest rates and



domestic U.S. interest rates. Also, of the \$11 billion increase in bank claims against foreigners, \$3.4 billion represented bankers' acceptances<sup>7</sup> made for the account of foreigners; mainly acceptance credits created to finance Japanese trade with countries other than the United States. However, purchases by U.S. accepting banks of their own acceptances for their loan portfolios amounted to only \$700 million during the period. This suggests that U.S. banks, in a period of strong domestic loan demand, were prepared to provide their banks' names in return for the acceptance fee (usually 1½ percent of the face value), but were unwilling to commit their funds.

Despite the termination of the VFCR program and the slight continuing incentive to move funds from the United States to the Eurodollar market in the first half of 1974, the overseas branches of U.S. banks improved their net creditor position vis-a-vis their head offices by \$500 million. There is evidence of a two-way flow with the monies coming in being short term and the increase in claims of head offices against branches being somewhat longer term—these being used to finance branch positions in the very active Eurocredit market in the first half of 1974. Overall, branches increased their claims against foreigners, excluding banks, by about \$9 billion in the first half of 1974, with about \$1 billion of this in loans to foreign governments, presumably related to financing of oil-related deficits.

In assessing the developments in the first part of 1974, it appears clear that the removal of the VFCR guidelines combined with favorable credit demand conditions had considerable impact on the international activities of U.S. banks. Both head offices and branches of U.S. banks

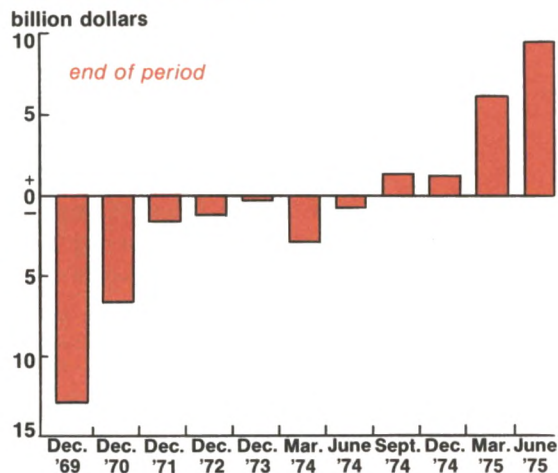
<sup>7</sup>Bankers' acceptances are negotiable drafts drawn to finance U.S. exports, U.S. imports, or trade between other countries and are termed "accepted" when a bank guarantees payment at maturity.

expanded their foreign credit activities rapidly. However, the head offices did not make use of the placement capacity that their branches had built up during the VFCR period.

### Consolidation: Second half, 1974 through first half, 1975

By mid-1974 conditions in international banking markets were strained in the wake of revelations of foreign exchange losses by several European banks and the actual failure of the I.D. Herstatt Bank in Germany. The uncertainties flowing from these developments caused some depositors to become distrustful of placements with Eurodollar banks, including the branches of U.S. banks. The considerable differential between Eurodollar interest rates and domestic U.S. rates that appeared in the third quarter of 1974 could be characterized as the premium that depositors required for the placement of funds in the Eurodollar market. (The interest rate differential was over 200 basis points on instruments with a three-month maturity.) This made it extremely attrac-

### Head offices became net creditors of their overseas branches in 1974





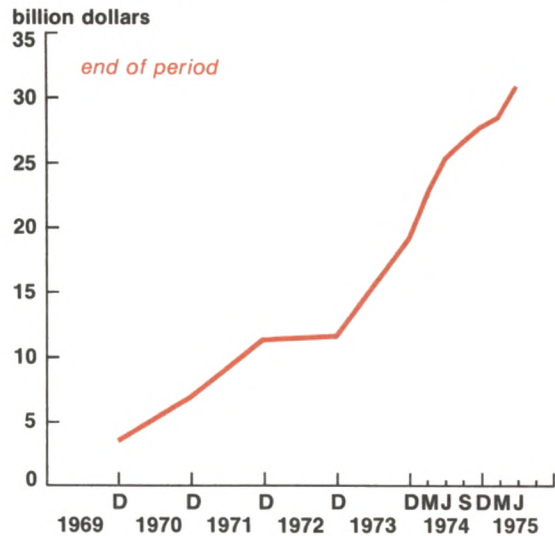
tive for U.S. banks to shift funds from head offices to branches to support loan activity.

Head offices of U.S. banks became net creditors of their overseas branches in the third quarter of 1974, reversing a debtor-creditor relationship that had persisted since the initiation of the VFCR program in 1965. The experience of this period proved beyond doubt that when a wide differential exists between Eurodollar and domestic U.S. interest rates, head offices of U.S. banks, unrestrained by the VFCR program, would supply the funds required by the lending activities of their overseas branches.

In the last quarter of 1974 and the first quarter of 1975 there was a narrowing of the interest rate differential between the Eurodollar market and the U.S. market, but no full-scale return to the "normal" differential established in the first half of 1974. The narrowing was attributable largely to official statements in the third quarter that lender-of-last-resort assistance would be available under appropriate circumstances to Euromarket participants. As domestic loan demand weakened late in 1974, U.S. banks, recognizing the continuing differential between Eurodollar and U.S. interest rates, tended to make money market placements with foreign banks. In addition, U.S. banks so increased their rate of purchase of their own bankers' acceptances and those of other banks, that total investments in acceptances increased by \$950 million in the fourth quarter of 1974.

In the first quarter of 1975 there was a notable revival in medium-term Eurocredit markets as domestic bank loan outstandings dropped rapidly in the United States. The revival in activity in the Eurocredit market continued through the second quarter with developing countries, including certain oil-exporting countries—

### Intra-network claims of overseas branches increased dramatically in the seventies



such as Algeria and Indonesia—reentering the market as borrowers, and with U.S. head offices increasing net claims against overseas branches by almost \$5 billion through the first quarter and nearly \$4 billion in the second quarter. Branches in the Caribbean and United Kingdom—really, the money management centers for the U.S. bank branch networks—were the initial recipients of the funds made available by the U.S. head offices. These branches, in turn, booked loans to borrowers in Eurocredit markets either by entering into syndicated loan arrangements or by making funds available to downstream branches.

It appears that the U.S. recession with its accompanying reduction in demand for domestic credit has been a prime stimulant to the integration by U.S. banks of their head offices and overseas branch networks.

*Allen B. Frankel*



# Advertising for demand deposits

Advertising, a form of non-price competition, is particularly interesting in banking because Regulation Q of the Board of Governors of the Federal Reserve System severely circumscribes price (interest rate) competition. Since payment of interest on demand deposits is prohibited, studying advertising illustrates one way banks can partially compensate for this enforced absence of price competition.

An analysis of demand deposit advertising also helps illustrate how an intuitive economic hypothesis can be tested against empirical evidence. The hypothesis is that interbank variations in intensity of demand deposit advertising can be explained by differences in market structure characteristics and individual characteristics of specific banks. A formal statement of the hypothesis, embodying 11 such characteristics, can be tested against the behavior of a sample of banks.

Much of the data needed to test the hypothesis comes from reports submitted by 160 Seventh District member banks participating in the 1972 Functional Cost Analysis program sponsored by the Federal Reserve Bank of Chicago.<sup>1</sup> The

<sup>1</sup>The FCA program is designed to provide an accurate and meaningful yet simplified cost accounting framework for commercial banks. Conceptually, the operations of a bank are broken down into three broad categories: fund-providing functions, fund-using functions, and non-fund-using functions. Demand deposits, for example, are a fund-providing function, while investments, credit card loans, and mortgage loans are examples of fund-using functions.

Thirty-five expense items are reported, one of which is "publicity and advertising." As with most expense items, some part of total advertising cost is overhead, meaning it is not chargeable to any particular operating function. FCA allocates these overhead costs among bank functions by indirect means. Because this indirect allocation should properly be attributed to overhead, only those advertising expenditures allocated directly by the banks are used in calculating advertising intensity.

sample banks range in size from under \$5 million to over \$1 billion in total deposits, with a mean size of \$32 million and a median size of \$45 million. Sixty-six of the banks are chartered in Illinois, 20 in Indiana, 29 in Iowa, 21 in Michigan, and 24 in Wisconsin. Ninety-four of the banks are located in Standard Metropolitan Statistical Areas and 23 are affiliated with bank holding companies.

Dollars spent on demand deposit advertising per million dollars of demand deposits, as reported by FCA participants, is the measure of advertising intensity for the purpose of this article. According to annual averages for all participants in the nationwide FCA program, this figure has risen considerably in recent years. For banks in the under \$50 million category, this ratio rose 72 percent from 1966 to 1974. In the larger size categories the increase was over 100 percent. Although demand deposit advertising accounts for a small share of total operating expense—between  $\frac{1}{4}$  and  $\frac{3}{4}$  of 1 percent—it represents between 2 and 3 percent of the total costs of serving demand deposits and about one-fourth of the entire advertising budget.

## Market structure characteristics

For purposes of this article, a bank's market is defined as the county within which the bank (or its head office) is located. Two arguments support this definition, although, in reality, bank markets rarely coincide with political boundaries. First, most people transact their banking business either near their homes or near their jobs, and data for the Seventh District show that a large majority of people reside and work in the same county. Second, the Board of Governors of



the Federal Reserve System frequently uses county boundaries to approximate local banking markets.

Several aspects of market structure would seem to have important influences on the intensity of deposit advertising. Among these are the degree of competition from nonbank financial intermediaries, the number and size distribution of competing banks, the strength of demand for bank loans, branch-banking restrictions, and the urban or rural character of the market. Many interrelationships exist among these characteristics.

In undertaking an advertising campaign, a bank expects to attract deposits primarily from two sources—from other banks and from nonbank financial intermediaries (e.g., savings and loan associations, credit unions, etc.). The influence of one bank's advertising on other banks in its market is called an "intra-industry effect," while the influence of a bank's advertising on other intermediaries is called an "inter-industry effect."

Considering only inter-industry effects, a monopoly bank is particularly well-situated to judge the optimal advertising expenditure since it derives the entire inter-industry benefit. When more than one bank operates in a market, no bank may wish to advertise unless it knows how much its competitors will advertise in response since nonadvertising banks will derive some inter-industry benefits from other banks' advertisements. If the number of banks in the market is small, or if a few banks dominate the market, banks may be able to act as if they were, so to speak, a monopolist. Therefore, the greater the concentration of banking resources, the greater the expected advertising expenditure by any individual bank.<sup>2</sup>

Demand for bank loans relative to the

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<sup>2</sup>Concentration is measured by the Herfindahl index. See "Bank Holding Companies—Concentration Levels in Three District States," *Business Conditions*, June 1975, p. 14.

supply of lendable funds determines the profits to be made on loans and thereby influences a bank's incentive to advertise to attract deposits. The best measure of the strength of loan demand relative to the supply of funds—the net yield on loans (average rate of return on loans minus "cost of money")—is not without problems. In planning their advertising strategies, banks respond to the *expected* future rate of return on loans. The present *actual* rate only approximates the yield on loans to be made in the future. Furthermore, actual rates of return will tend toward equality even though banks' expectations of future rates may differ widely. Where expected future rates are very high, banks are encouraged to compete more intensely for lendable funds, thus driving down net profit rates. The converse holds where expected rates are low.

Banks can use non-price means other than advertising to attract deposits. Probably the most important of these is to establish branch offices, thereby making it more convenient for customers to deal with the branching bank than with a competitor. Illinois statutory restrictions on branch banking are considerably more stringent than those in other Seventh District states. Because branching is not an available alternative, Illinois banks are likely to advertise more than banks in other district states.

Advertising intensity may differ according to whether bank markets are urban or rural. There may be important cost differences, both because population densities are higher in urban areas and because different advertising media predominate in the two types of areas. Better transportation reduces economic distances among banks in urban areas, thereby intensifying competition and making locational differences less important in urban than in rural areas. On the whole, it is impossible to predict whether urban or rural banks will advertise more.



### Individual bank characteristics

While the behavior of banks in a given market is conditioned by their environment, banks retain many pronounced individual differences. Six such individual characteristics would seemingly have an important influence on a bank's advertising expenditure—relative size of the bank within the market, average account size, rate of growth of bank deposits, variability of deposits around their growth trend, age of the bank, and holding company affiliation.

As has been indicated, one of the important aspects of market structure is the size distribution of banks. In addition to the overall degree of concentration within the market, the relative size of the individual bank may also be important. The larger a bank's market share, the larger the proportion of inter-industry effects it can expect to enjoy, but the more vulnerable it may feel to competitive inroads from other banks' advertising. These influences operate in opposite directions—the former tending to increase the bank's advertising as its market share increases, the latter to decrease it. On balance, banks with larger market shares are expected to advertise more than their smaller rivals.

Banks differ considerably in their orientation toward personal or business deposit accounts, and a specific bank's advertising would echo this orientation by being geared either to retail or to wholesale customers. Banks actively seeking corporate deposits would probably choose different media from those chosen by banks aiming at personal accounts. Because banks with many corporate depositors will have more large accounts, average account size is included in the analysis to control for wholesale/retail orientation.

Given the rate of growth of demand for bank loans, a bank forecasting a substantial rise in deposits will not need to adver-

tise as much as a bank that expects slow deposit growth. If forecasts are based on recent deposit experience, banks whose deposits have grown rapidly in the past will advertise less.

The historical growth rate of deposits may not be sufficient for making reliable forecasts of expected short-term increases in bank deposits. Another important piece of information is the variability of deposits around their growth trend. The higher the level of deposit variability, the less reliable is the long-term growth rate since deposits are more likely to deviate substantially from their trend in the short run. This means that average deposit growth cannot be relied upon to provide increased lendable funds. Therefore, banks experiencing high deposit variability can be expected to advertise more than banks with low deposit variability.

The need for new banks to make their existence known and to differentiate themselves from older competitors tends to make them advertise more than older banks. On the other hand, because new banks can take advantage of recent demographic shifts, they may enjoy superior locations. On balance, one would expect forces favoring higher advertising intensities by new banks to predominate.

The influence of holding company affiliation on bank performance is only imperfectly known. Holding companies centralize some functions in the parent organization to minimize duplication of effort by subsidiaries and to take advantage of any economies of scale. To the extent that subsidiary banks benefit from association with a parent holding company, such banks may enter into a centralized advertising arrangement with lower advertising intensities.

### Regression analysis

Regression analysis is a statistical technique designed to measure the sepa-



## Regression analysis

Empirical economic research seeks to explain the behavior of one economic variable in terms of other factors. The variable to be explained is usually called the "dependent variable" because its value is assumed to depend upon other factors, i.e., "independent variables." The set of relationships used to explain one or more dependent variables is called a "model." Validation or rejection of a model hinges on a comparison of the theoretical description with the actual behavior of economic agents.

Regression analysis is a technique used to determine whether changes in the value of the dependent variable can be systematically associated with changes in the values of one or more independent variables. A regression coefficient shows the change in the dependent variable resulting from a one-unit change in an independent variable. Regression techniques can also disentangle, to some extent, the influence of one independent variable from the simultaneous influences of the others. Accordingly, regression analysis is a technique applied when many factors combine to influence the value of one variable.

The ability of the independent variables jointly to explain the dependent variable can be measured by the proportion of the total variation in the dependent variable systematically associated with variations in the independent variables. The larger the proportion of explained variation, the better the model "fits," or accords with, reality. How well any particular independent variable explains the dependent variable is judged by the size of its regression coefficient relative to the size of the coefficient's standard error. Those variables whose coefficients are largest

relative to their standard errors are the most powerful explanatory variables.

The following table presents the regression results discussed in this article. The left-hand column lists the independent variables, and the three right-hand columns present the coefficients on these variables in the three regression equations.

Variables	Coefficients (standard errors in parentheses)		
	Run 1	Run 2	Run 3
Concentration (numbers equivalent)	-.005 (0.005)	-.008 (0.004)	-.007 (0.004)
Loan yield	0.009 (0.052)	0.013 (0.048)	
Loan growth			0.113 (0.087)
Branching restrictions	0.112 (0.078)	0.113 (0.072)	0.099 (0.071)
Urban area	-.020 (0.067)		
Market share	0.001 (0.003)		
Average account size	-.002 (0.002)		
Deposit growth	0.010 (0.010)		
Deposit variability	0.295 (0.066)	0.327 (0.047)	0.328 (0.046)
Age	-1.27 (2.15)		
Holding company	-.001 (0.092)		
(Intercept)	0.261 (0.158)	0.265 (0.133)	0.054 (0.195)
Proportion of variance explained	0.276	0.265	0.272



rate influences that any number of causal variables exert on some “dependent” variable. Regression analysis, used to examine the hypothesis described in this paper, indicates that only three characteristics (causal variables) discussed in preceding sections have a significant influence on advertising intensity (the dependent variable).

Only one individual characteristic of a bank—as opposed to market structure characteristics—significantly influences advertising intensity. Regression analysis shows that greater variability of deposits around their growth trend is strongly associated with higher advertising intensity. For the average bank in the sample, a 10 percent increase in deposit variability leads to a \$15 increase in advertising per million dollars of demand deposits. The average amount of advertising for all banks in the sample is \$430 per million dollars of deposits.

Market concentration and branching restrictions also are significant determinants of advertising expenditure. Average concentration for the sample approximates a level represented by ten equal-sized banks. If concentration were to rise—say, by a decline in the number of equal-sized banks from ten to nine—results indicate that advertising expenditures would rise by \$7 or \$8 per million dollars of deposits.<sup>3</sup> The empirical results also show that Illinois banks on average spend \$100 more per million dollars of demand deposits on advertising—a result at-

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<sup>3</sup>If all banks in a market were the same size, the value of the Herfindahl index of concentration would be  $1/N$ , where  $N$  is the number of banks. Using this arithmetic property, the reciprocal of the Herfindahl index, the so-called “numbers equivalent,” indicates how many equal-sized banks generate a level of concentration comparable to that in the market. For example, assuming a Herfindahl index of .255, the numbers equivalent ( $=1/.255$ ) of 3.9 indicates that about four equal-sized banks generate the same level of concentration as five banks with market shares of 40, 20, 15, 15, and 10 percent. *Ibid.*

tributed to the inability of Illinois banks to seek deposits through branching.

Regression analysis also indicates that demand for loans influences advertising expenditures. The best way to measure demand for loans, relative to the supply of lendable funds, is by the net rate of return on loans. This variable, however, has no statistical association with advertising. If the expected *growth* in demand for loans is approximated by the actual rate of increase of loans over a recent period, a moderately significant association appears between loan demand and advertising intensity, but the effect is small. An especially surprising result of the analysis is that the other individual bank characteristics enumerated in previous sections have so little effect on bank advertising.

## Conclusions

The analysis presented in this article shows that three factors—branching restrictions, market concentration, and deposit variability—are sufficient to account for about 30 percent of the variation in advertising intensity by a sample of 160 banks. The important influence of branching restrictions clearly indicates the far-reaching effects that legal constraints can have on bank behavior. The significance of concentration shows how heavily bank behavior is conditioned by the force of competition from other banks. The strong relationship between advertising and the variability of deposits around their growth trend shows that the avoidance of uncertainty strongly influences bank decision making. The failure of other bank characteristics to influence advertising significantly suggests that banks may, in fact, be much alike in their advertising behavior regardless of size, age, and ownership.

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