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Pieces of Eight

An Economic Perspective on the 8th District

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Catfish Are Jumpin'

Why Are There Foreign-Owned Firms in the Eighth District?

District Bankers Sustain Profitable Course

THE EIGHTH FEDERAL RESERVE DISTRICT



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The Emerging Importance of Aquaculture

by Kevin L. Kliesen

Kevin B. Howard provided research assistance.

When people consider the various enterprises associated with agriculture, aquaculture is unlikely to spring to mind. Simply put, aquaculture (or, as it is commonly called, “fish farming”) is the growing and harvesting of fish—similar to any other agricultural commodity—for human consumption or other purposes. Since the 1960s, selected states in the Eighth Federal Reserve District have played a major role in the emergence of the largest component of the domestic aquaculture industry—the channel catfish. This article examines the growth of the catfish industry in the Eighth District, looks at recent trends, and discusses future challenges.¹

Supply and Demand Trends

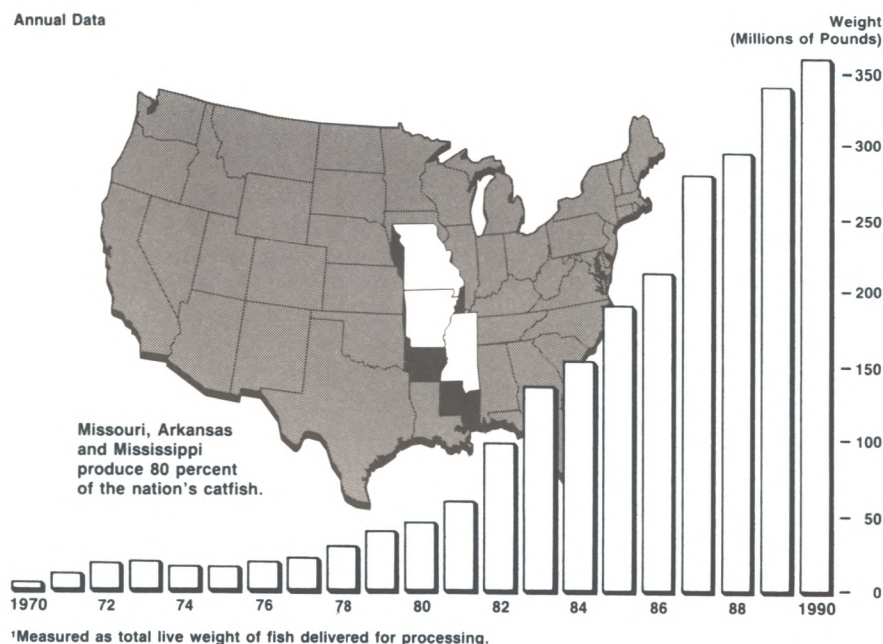
U.S. aquaculture is a diverse industry—producing everything from alligators to baitfish.

One key sector is the production of farm-raised channel catfish. In 1990, catfish production was the fourth most valuable fish crop in the United States—just behind salmon, shrimp and crabs. Total catfish sales reached a record \$323.2 million in 1990, a 19.8 percent increase over 1989. In fact, since 1981, catfish sales have grown at an average annual rate of 18.2 percent. In comparison, the total value of U.S. commercial fish landings between 1981 and 1990 increased at an annual rate of 4.6 percent from \$2.4 billion to \$3.6 billion.²

The growth of the catfish industry since the early 1970s has been rapid. As shown in figure 1, catfish production in 1970 totaled about six million pounds; production then grew rapidly, reaching 46.5 million pounds in 1980—an average annual growth rate of 23.3 percent. Although the production numbers posted in the 1980s dwarf those of the 1970s, the average annual growth rate from 1980 to 1990 is still 22.7 percent. Growth, however, has slowed in recent years. From 1987 to 1990, production has increased at an average annual rate of 8.7 percent; year-to-date production as of September 1991 is up 5.9 percent from one year earlier.

One factor contributing to the slowdown in production is the disincentive of lower prices. The average price paid to producers in September 1991

Figure 1
Total Catfish Production



Agriculture

(59 cents per pound) was roughly 21 percent less than the previous year and was the lowest in more than four years.³

Additional perspective on the growth of the catfish industry can be gained by examining the number of producers and the number of acres of water surface area devoted to catfish production. In 1982, there were 987 operations producing catfish. Operations more than doubled to 1,987 in 1988. Since then, the number has increased slightly—rising to 1,998 as of July 1, 1991.

The doubling of catfish operations has produced a commensurate increase in water surface area. In 1982, 73,840 acres were used in catfish production. By July 1991, this number had more than doubled to 166,160. Furthermore, this acreage understates somewhat the actual production capacity of the industry, as an additional 13,000 acres are reported as either under construction, under repair or withheld from production. The number of producers has declined for the past two years, while water surface area has continued to increase, which reflects a trend noticed in other agricultural sectors, namely, a larger production capacity per farmer.

The increased production of catfish—and larger harvests of wild fish species—suggests that an increase in demand for fish has occurred. Indeed, per capita fish consumption has increased steadily over the years. This trend has coincided with an upward trend in poultry consumption and a downward trend in beef and pork consumption. For example, in 1980, per capita consumption of fish measured 12.5 pounds, beef consumption measured 72.1 pounds and poultry consumption measured 42.6 pounds. Since 1980, per capita consumption of fish has risen by an average annual rate of 2.2 percent to 15.5 pounds in 1990. During the same period, per capita poultry consumption has risen by nearly twice as much—4.1 percent per year—while beef consumption has *fallen* by 1.2 percent per year.⁴

One well-publicized factor that partially explains the preceding trends is the change in consumer preferences away from red meat toward fish and poultry. While the dietary benefits of increased fish and poultry consumption—at the expense of red meat consumption—are open to debate, this shift in consumer preferences has certainly aided the catfish industry.

Changes in supply and demand for fish, poultry and beef affect not only the quantities consumed and produced, but also their prices. Figure 2 shows catfish, beef and broiler prices from 1970 to 1990. In 1970, catfish prices averaged \$2.15 per pound, while beef prices averaged \$1.98 per pound and chicken prices averaged \$0.68 per pound. Although the inflation-adjusted price of all three goods has decreased between 1970 and 1990, the price of broilers has decreased much more than

beef or catfish. This may explain the higher growth rates of per capita broiler consumption.

Production by States

Although catfish is grown commercially in several states, a few states dominate the process. Table 1 shows that the six largest producing states account for roughly 94 percent of U.S. catfish sales, 71 percent of all operations and 93 percent of water surface area devoted to catfish production. Moreover, approximately 80 percent of all domestic catfish production occurs in the District states of Arkansas, Mississippi and Missouri.

Mississippi is, by far, the largest catfish-producing state in the United States. As of July 1, 1991, Mississippi had a little more than one-half of the U.S. water acreage devoted to catfish production and slightly more than two-thirds of U.S. catfish sales. Although catfish production in Mississippi is fairly widespread, two counties in the Delta region account for more than one-half of the water surface acreage. In fact, Humphreys County—with 31,865 acres—and Sunflower County—with 24,420 acres—each have more acres of catfish production than any other state.

As of 1990, catfish farming in Mississippi accounted for approximately 17 percent of livestock and products cash receipts and roughly 9 percent of total cash receipts (excluding government payments). Furthermore, at \$227 million, cash receipts from catfish operations in 1990 exceeded the *combined* cash receipts from corn, rice and wheat by nearly \$65 million.

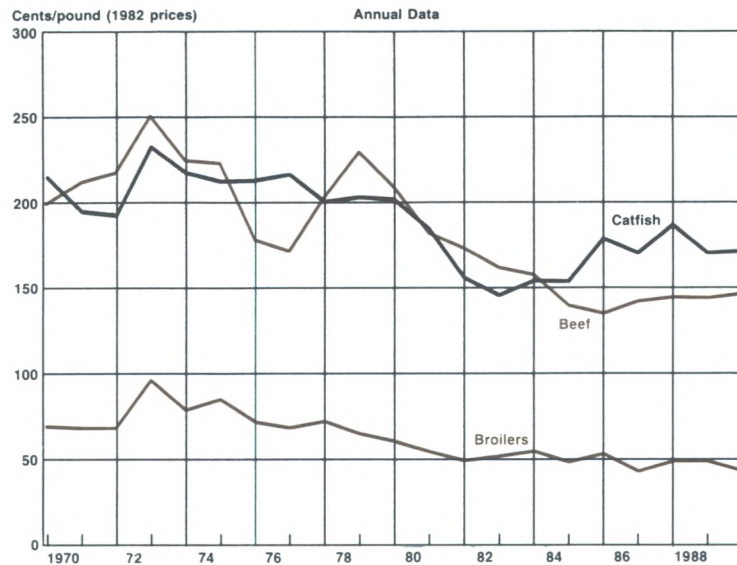
The dominance of Mississippi catfish farming is reinforced by looking at Arkansas—the nation's second-largest catfish-producing state. In 1990, Arkansas had total sales of just under \$30 million. Although significant, this was still just over \$1 for every \$8 sold by Mississippi growers. Similarly, production acreage in Arkansas, at about 21,000 acres, is less than one-quarter of that in Mississippi. Moreover, the average size per operation is exactly one-third as large as it is in Mississippi.

Catfish production in Arkansas occurs in several counties, but the greatest concentration is located in the extreme southeastern counties of Chicot and Ashley. Because of Arkansas' diversified agricultural sector, the catfish industry does not generate as large a share of agricultural output as it does in Mississippi. In fact, in 1990, catfish sales in Arkansas were 1.1 percent of livestock cash receipts and an even smaller 0.7 percent of total cash receipts.

Missouri is the only other District state to have significant commercial catfish production. As of July 1991, Missouri had 2,800 water surface

Figure 2

Prices of Wholesale Catfish, Beef and Broilers



acres engaged in production. This was same as last year and an increase of 200 acres from two years ago. Total sales, however, increased from \$2 million in 1989 to \$2.6 million in 1990. Other District states that have catfish production include Illinois, Kentucky and Tennessee. These states have relatively small operations, though, with each under 500 total acres.

Challenges Faced by the Catfish Industry

According to analysts, the largest obstacle facing the catfish industry today is over-capacity in the processing sector. Although it is estimated to be at least 50 percent—and possibly as much as 100 percent or more—processing capacity continues to increase.

This expansion has tended to increase the supply of catfish and reduce the real price of catfish received by the processing firm. In 1989, total processor sales of catfish (in pounds) increased 17.9 percent from the previous year; in 1990, although fairly moderate, the increase was 3.9 percent. Through September of this year, processor sales are running 5.9 percent ahead of last year's total. During the same period, real prices received by catfish processors have declined from an average of \$1.87 per pound in 1988 to \$1.71 per pound for 1990 (see figure 2). Moreover, since January 1991, real processor prices have fallen from \$1.61 per pound to \$1.48 per pound; this is nearly a 21 percent decline in real prices in a little

more than two years, and the lowest price in roughly six years. Consequently, profit margins have likely shrunk or turned negative for some processors. Economic theory suggests that those processors who are the least efficient at employing their economic resources will likely be forced out of the business.⁵

Despite this problem, the industry continues to add capacity.⁶ One explanation for this puzzling behavior might be that future prices are expected to be significantly higher, though there is no evidence to support such an explanation. Two other explanations provide better insights. First, grants have been issued by federal and state governments to build catfish processing plants in economically depressed areas with a goal of creating jobs. Second, catfish growers, lacking a viable marketing alternative for their product, band together to build a processing plant. Given that 75 percent to 85 percent of all processing plants are farmer-owned, this behavior may have been a response to the high growth in stocking rates undertaken by growers since the late 1980s.

A second, more long-term challenge facing the catfish industry is how to increase product awareness. The broiler industry faced an identical problem in its recent history. As the broiler industry developed new marketing techniques (admittedly, other factors such as vertical integration and mass production played a significant part as well), the industry began to post impressive growth.

A recent study found that slightly more than one-half of the respondents to a nationwide survey had heard of farm-raised catfish.⁷ More importantly, the study also found favorable attitudes toward

Table 1
Catfish Statistics By State

State	No. of Operations ¹	Water Surface Area ¹	Sales ²	Average Acres per Operation
Arkansas	202	20,700	\$ 29.6	102
Alabama	353	18,700	24.1	53
Louisiana	225	14,500	15.2	64
Mississippi	310	95,000	227.4	306
Missouri	125	2,800	2.6	22
Texas	202	3,300	6.0	16
Total U.S.	1,998	166,160	323.2	83

¹Measured as of July 1, 1991. Water surface area measured in acres.

²Total catfish sales for 1990 in millions of dollars.

SOURCE: Operations and water surface area taken from *Aquaculture Situation and Outlook*, United States Department of Agriculture (September 1991). Total sales listed in *Aquaculture Situation and Outlook* (March 1991).

catfish among consumers, grocers and restaurants. Not surprisingly, favorable attitudes tended to be the highest in the South and the lowest in the Northeast. These favorable inclinations may have induced the McDonald's Corporation to test-market a catfish sandwich in parts of five Southern states. Such marketing attempts by fast food chains, grocers and restaurateurs, as well as those by the industry itself, appear to be essential to continued expansion of the industry.

The industry faces other challenges as well. These include issues related to waste disposal in the growing and processing sectors and the potential gains that could result from genetic engineering, such as nutritional improvements and productivity gains resulting from a more efficient feed conversion process.

Because the catfish industry has become an important economic entity in the Delta Region, another concern is the maintenance of a viable labor force.⁹ Although the industry is relatively capital-intensive, the demand for experienced workers, whether in the growing or processing sector, remains high. As a consequence, average (nominal) wages in the processing sector have risen by

approximately 20 percent since last year. Although this wage increase resulted primarily from collective bargaining agreements reached last year between catfish processors and workers' unions, the fact remains that processors were willing to pay even higher premiums in some cases because of shortages of workers with certain skills.

Summary

Few industries in the agricultural sector can match the high growth rates posted by the farm-raised catfish industry during the last 20 years. Although the growth rate has slowed somewhat, the increasing importance of fish in the consumer diet should enable catfish to play a larger role in the future. Whether the catfish industry can become the high-growth broiler industry of the 1990s is not certain. What is certain, however, is that the farm-raised catfish industry faces many of the challenges—and opportunities—inherent to a relatively new industry.

¹The author wishes to thank Seymour Johnson, Mike McCall and David Harvey for providing assistance.

²U.S. commercial fish landings are classified as harvest of wild fish species (for example, salmon, shrimp or crabs) and exclude aquaculture products such as catfish or trout.

³Catfish prices tend to be seasonal. The price of the good, therefore, will be at its highest (lowest) when demand for the good is at its peak (trough).

⁴Measures of per capita consumption are on an edible weight basis.

⁵A good example would be the bankruptcy of a large processor in Texas, which had difficulty competing in the current market environment of tight profit margins.

⁶See the *Catfish Journal*, Catfish Farmers of America (April 1991), p. 6 and p. 11.

⁷See Carole Engle, et. al. "The U.S. Market for Farm-Raised Catfish: An Overview of Consumer, Supermarket and Restaurant Surveys," Arkansas Agricultural Experiment Station, Bulletin Number 925 (September 1990).

⁸These and other issues are discussed in David Harvey, *Aquaculture Situation and Outlook*, United States Department of Agriculture (September 1991).

⁹According to one unofficial estimate, the catfish industry annually contributes almost \$2 billion to Mississippi's economy and employs approximately 8,000.

How Foreign-Owned Firms Benefit the Eighth District

by *Cletus C. Coughlin*

Kevin M. White provided research assistance.

Multinational corporations (MNCs) play an important and frequently controversial role in international trade and investment. The foreign investment decisions of MNCs, which have important consequences on production, employment and international trade, affect the well-being of residents across many countries. As a result, it is not unusual to hear leaders of some countries express concerns that foreign investment is excessive, while others worry that it is insufficient. The former fear exploitation and foreign dominance of their economies; the latter fear inadequate access to foreign capital and technology.

Until recently, the United States was generally viewed as a “home” country for MNCs rather than a “host” country for foreign-based MNCs. In every year since 1981, however, investment by foreign-based MNCs in the United States has exceeded investment by U.S. firms abroad. Eighth Federal Reserve District states have received a portion of this increasing flow of foreign direct investment in the United States.¹ This article, after a brief explanation of foreign direct investment (FDI) and two competing views of foreign investment theory, examines the extent of FDI in the Eighth District.

What is Foreign Direct Investment?

FDI is any flow of lending to, or purchases of ownership in, a foreign enterprise that is “largely” owned by residents of the investing country. It can be a loan from a parent to its subsidiary or the purchase of the subsidiary’s stock by the parent. The percentage of ownership that defines “largely” varies; however, the minimum percentage is selected to allow the investor some control over the operation of the enterprise. The official U.S. definition of FDI requires the investing firm to have a minimum of 10 percent ownership of the enterprise in the United States.

The investor’s control over the subsidiary’s behavior allows for much complexity in their relationship. The parent might provide its subsidiary

with managerial skills, trade secrets, technology, rights to use brand names and instructions about its involvement in certain markets. Such transactions make FDI much more than simply a movement of capital from one country to another. For example, a parent can build a production facility in a foreign country by using funds borrowed in the host country. By adding its brand name, managerial formulas and other intangible assets, the parent can effectively engage in FDI, in an accounting sense, without an explicit flow of capital from the parent’s country to the host’s country.

What Explains FDI?

Standard theories rely on “firm-specific advantages” to explain why FDI occurs. The foreign investor must have some advantage over local firms to compensate for the fact that the MNC incurs additional costs because of 1) cultural, legal, institutional and linguistic differences; 2) a lack of knowledge about local market conditions; and 3) lengthier lines of communication and, therefore, an increase in communication failures.

Advantages held by the foreign investor can take many forms. Technology is the primary advantage; however, access to large amounts of capital, superior management and products differentiated by successful advertising are often cited.

A company’s advantages are exploited by FDI only if, given the firm’s information and expectations about its prices, costs and legal environment, it can earn higher profits. It is possible that a technological advantage, defined broadly as economically valuable knowledge, can be exploited by exports to a country as well as by production and sales in that same country. Thus, the firm selects FDI over exporting only if the former is more profitable. FDI and exporting, however, are not the only alternatives. A firm with a technological advantage may license a firm in another country to produce a good using its technology. Once again, the firm with the technological advantage will choose the route with the highest anticipated profits.

Firm-specific advantages have led scholars to develop theories of FDI in which the MNC has some unique market power. Two variants, one most closely associated with Stephen Hymer and the other with Stephen Magee, demonstrate this approach.²

In Hymer’s view, because a foreign direct investor is one of a small number of producers of a specific good, the firm can affect the price of the good by altering its production. By decreasing its production, the firm can force the market price higher and vice versa. Hymer views FDI as being used strategically by the MNC to limit competition

Business

Table 1
Royalties and License Fees (millions of dollars)

	Receipts of U.S. affiliates from foreign parents	Payments by U.S. affiliates to foreign parents
1982	\$ 69	\$ 394
1983	60	465
1984	68	665
1985	102	568
1986	171	773
1987	209	1105
1988	243	1244
1989	343	1662
1990	333	1954
Compounded annual growth rate	21.7%	22.2%

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

to protect its market power. Thus, the MNC engages in FDI to beat its competitors into a particular foreign market.

Some concerns have been raised about FDI in this context because of fears that the foreign investor, as part of the firm's commitment to investment, will extract promises from the host government to limit imports from other competitors or prevent FDI by other competitors. If this were to happen, there would be little competition in the host country for the foreign investor. Consumers would ultimately pay higher prices than they would in the absence of trade or investment restrictions.

In Magee's view, which is known as the appropriability theory, the firm-specific advantages that stimulate FDI do not threaten competition in product markets. Even though firm-specific advantages allow the MNC to generate profits, they do not necessarily imply that the firm will have market power in product markets. Rather, FDI allows the benefits of technology to spread.

FDI is necessary for the firm to "appropriate" the potential gains from its technology. Generally speaking, the reasons to favor FDI rather than the explicit sale of the advantage to outsiders revolve around the difficulties involved in market transactions. In some cases, the technology involved in a particular activity, such as running a factory, is embodied in a group of individuals. Since the knowledge is not easily summarized and communicated, it is hard to package and sell. Such a market transfer is also complicated because it is difficult for a potential buyer to decide how much the knowledge is worth. If the buyer had sufficient information to value the knowledge, it is likely that the buyer would know as much as the seller and, thus, have no reason to buy.

The appropriability theory, therefore, stresses the importance of the transfer of technology from

one country to another within a MNC. Restrictions on FDI limit the transfer of the firm-specific advantages of MNC. Since these advantages contribute to rising productivity and incomes, restrictions on FDI flows into a country can harm that country's economic performance.

The preceding views of FDI stress the importance of the transfer of technology from a parent to its foreign affiliate. MNCs, however, can also transfer technology from the affiliate to the parent. Rapid increases in foreign direct investment in the United States during the 1980s have aroused concern that foreign firms are, in fact, investing primarily to acquire U.S. technology, which could harm the competitive position of U.S. firms.

One way to assess international transfers of technology involving U.S. affiliates of foreign-based MNCs is to compare receipts of royalties and license fees from their foreign parents with payments of such fees to their foreign parents. Receipts measure the value of technology transferred from foreign-owned companies in the United States to their parents, while payments measure purchases of technology from their parents. According to table 1, both measures have increased at annual rates of more than 20 percent since 1982. Payments of U.S. affiliates, however, far exceed receipts in each year and are nearly six times the value of receipts in 1990. Thus, technology transfers are occurring to a far greater extent from foreign-based MNCs to their American affiliates than the reverse.

FDI in the Eighth District³

One indicator of the involvement of foreign-based MNCs in economic activity in the Eighth District is the employment at affiliates owned by

Table 2
Employment at Nonbank Foreign-Affiliated Firms

	Employment (thousands of people)		Annual Growth Rate	Percent of all Nonbank Employment	
	1977	1988		1977	1988
Arkansas	9.8	25.9	9.2%	1.6%	3.5%
Kentucky	15.5	43.6	9.9	1.6	3.8
Missouri	20.2	56.1	9.7	1.3	2.9
Tennessee	26.2	95.6	12.5	1.9	5.4
Eighth District	71.7	221.2	10.8	1.6	4.2
All States	1,200.3	3,662.8	10.7	1.8	4.1

SOURCE: U.S. Department of Commerce, *Foreign Direct Investment in the United States* (August 1991).

Table 3
Manufacturing Employment at Foreign-Affiliated Firms

	Manufacturing Employment (thousands of people)		Annual Growth Rate	Percent of all Manufacturing Nonbank Employment	
	1977	1988		1977	1988
Arkansas	8.5	14.8	5.2%	4.1%	6.5%
Kentucky	7.0	23.4	11.6	2.5	8.5
Missouri	13.7	23.9	5.2	3.1	5.5
Tennessee	21.5	61.7	10.1	4.2	12.0
Eighth District	50.7	123.8	8.5	3.5	8.5
All States	685.6	1,495.0	7.3	3.5	7.7

SOURCE: U.S. Department of Commerce, *Foreign Direct Investment in the United States* (August 1991).

these firms. As shown in table 2, employment at nonbank foreign-affiliated firms grew rapidly between 1977 and 1988 in the United States and in the Eighth District. The annual growth rate in the Eighth District was 10.8 percent, much faster than employment grew at nonbank domestic firms. As a result, employment at nonbank foreign-affiliated firms rose from 1.6 percent of all nonbank employment to 4.2 percent.

Among Eighth District states, Tennessee experienced the most rapid annual growth rate, 12.5 percent. This caused employment at nonbank foreign-affiliated firms to rise from 1.9 percent of all nonbank employment in 1977 to 5.4 percent in 1988. The other District states — Arkansas, Kentucky and Missouri — experienced growth slower than the national rate; nonetheless, in each of these states, the share of non-bank employment accounted for by foreign-affiliated firms more than doubled in the 11-year period.

The manufacturing sector has long been favored by foreign investors. The concentration of

foreign investment in manufacturing reflects the technical expertise of foreign firms, especially those in Japan and Germany. In the Eighth District, almost 56 percent of employees at foreign affiliates in 1988 worked in manufacturing plants. Nationally, manufacturing accounted for a smaller segment, employing 41 percent of workers in foreign affiliates.

The growth of foreign-affiliated manufacturing has been impressive. As shown in table 3, District manufacturing employment in foreign-affiliated firms rose from 50,700 in 1977 to 123,800 in 1988, an 8.5 percent annual growth rate. This growth is especially noteworthy because it occurred during a period in which total manufacturing employment in the District showed virtually no net increase.

Of the four District states, Arkansas has experienced the slowest growth in employment at foreign-affiliated manufacturers. Though the reasons are unclear, Arkansas' industrial structure may have contributed. Traditionally, Arkansas'

manufacturing sector has been concentrated in food processing and metals production, two sectors in which foreign direct investment has risen relatively slowly. Motor vehicle production, the recipient of a large portion of new foreign investment, is relatively unimportant in Arkansas. Unlike the other three District states, Arkansas has no major vehicle assembly plants. Nonetheless, manufacturing employment in foreign affiliates was fairly high in Arkansas throughout the 1980s, accounting for 14,800 jobs in 1988. These jobs represented 6.5 percent of total state manufacturing employment, 2.5 percentage points more than in 1977. The state's largest foreign-affiliated sector is machinery; this includes Fort Smith's Rheem Air Conditioning factory, which employs almost 2,000 workers.

Kentucky is the District state that has experienced the most rapid growth of foreign-affiliated manufacturing employment since the late 1970s. Employment in foreign affiliates accounted for just 2.5 percent of the state's manufacturing workers in 1977; by 1988, this figure had risen to 8.5 percent, reflecting the addition of 16,400 workers. The state's largest foreign-affiliated employers — Armco Steel Company in Ashland and Toyota's vehicle assembly plant in Scott County — both employ roughly 3,500 workers and are affiliated with Japanese owners. In November 1990, Toyota announced plans to invest \$800 million to expand its Scott County operations, which will double capacity to more than 400,000 vehicles a year and provide 1,500 new jobs. In addition, the new operations will increase demand for the products of Toyota's suppliers. Many factories producing automotive-related inputs have located in the region since the Toyota plant—and the Nissan plant in Tennessee—opened in the mid-1980s. Many motor vehicle suppliers are owned, totally or in part, by foreign firms, with the Japanese most heavily represented.

In contrast to Kentucky, growth in manufacturing employment at foreign-affiliated firms in Missouri has been relatively slow. Missouri's manufacturing sector employs more than 400,000 workers, but only a small proportion work at foreign affiliates. Nonetheless, in 1988, 5.5 percent

of manufacturing workers in Missouri were employed in foreign affiliates, up from 3.1 percent in 1977. The United Kingdom is the home of the state's two largest foreign-affiliated manufacturing firms: Purina Mills, Inc., located in St. Louis, was acquired by British Petroleum in 1986, while Fasco Company, which produces small motors, has its largest Missouri operations in Springfield. Each firm employs roughly 3,000 workers.

Foreign direct investment has boomed in Tennessee. In 1989, foreigners invested almost \$1.4 billion in new and expanded plants in Tennessee, more than 40 percent of the total investment in the state that year. Related to this investment is the fact that the number of Tennessee workers at foreign-affiliated manufacturing firms is more than double that of any other District state. Between 1977 and 1988, manufacturing employment at foreign-affiliated firms rose by more than 40,000, a 10.1 percent annual growth rate. New plants producing motor vehicles or related goods account for much of this growth. Nissan's motor vehicle plant in Smyrna, which employs approximately 4,000 workers, is currently expanding. By 1992, Nissan will be able to build 450,000 vehicles a year in Tennessee, twice as many as today. The second-largest foreign affiliate, Bridgestone, makes tires in Nashville.

Summary

Without question, foreign-affiliated firms have become a more important component of economic activity in the Eighth District. While it is relatively easy to identify the employment associated with these facilities, it is not as easy to quantify the technological impact associated with such foreign investment. Nonetheless, economic theory, as well as evidence at the national level, indicates that foreign technology is being transferred to affiliates located throughout the Eighth District. As a result, workers in the Eighth District are more productive and better paid than they would be without the foreign direct investment.

¹The Eighth District is defined as Arkansas, Kentucky, Missouri and Tennessee for purposes of this article.

²See Stephen Hymer, *The International Operations of National Firms: A Study of Direct Foreign Investment* (MIT, 1976) and Stephen Magee, "Information and the Multinational Corporation: An Appropriability Theory of

Direct Foreign Investment" in *The New International Economic Order: The North-South Debate*, Jagdish Bhagwati, ed. (MIT, 1977) for additional details.

³A lengthier discussion of trade and investment in the Eighth District is presented in the *1990 Annual Report of the Federal Reserve Bank of St. Louis*.

District Banks Navigate Recession's Waters

by Michelle A. Clark

Thomas A. Pollmann provided research assistance.

The banking sector, like most other industries, is affected adversely during national recessions. In this article, the performance of banks in the Eighth Federal Reserve District is compared with that of banks nationally during the recession that began in July 1990 as well as during previous recessions. Also examined is recent slow loan growth, which has been identified as evidence of a credit crunch—does it differ from previous recessions?

Banks Muddle Through 1990-91 Downturn

The effects of the 1990-91 recession on Eighth District banks have not been as severe as elsewhere in the United States. Falling employment and real estate values in New England, for example, are largely responsible for the loan problems and bank failures in that region. Losses from real estate loans, however, vary widely by type of loan, with construction and commercial real estate loans having considerably higher delinquency and loss rates than single-family mortgages. Banks with high ratios of single-family mortgages to commercial real estate loans—which include the vast majority of Eighth District banks—have fared much better during the last two years than banks with low ratios.

Table 1 illustrates the uneven effects of the 1990-91 recession on banks. Return on average assets (ROA), a measure of how well management is employing a bank's assets to earn income, declined at U.S. banks to 0.60 percent in June 1991, down

Table 1
U.S. and Eighth District Bank Performance, 1990-91

	March 1990	June 1990	September 1990	December 1990	March 1991	June 1991
Return On Average Assets¹						
All U.S. banks	0.77%	0.70%	0.62%	0.49%	0.66%	0.60%
U.S. peer banks ²	0.78	0.72	0.67	0.53	0.74	0.65
District banks	0.97	0.98	0.98	0.88	0.95	0.96
Net Interest Margin¹						
All U.S. banks	4.06	4.06	4.07	4.10	4.16	4.19
U.S. peer banks	4.44	4.47	4.46	4.50	4.46	4.50
District banks	4.18	4.19	4.22	4.21	4.17	4.23
Loans/Assets						
All U.S. banks	62.0	61.9	62.2	62.1	62.3	61.3
U.S. peer banks	62.0	61.9	61.9	61.2	61.4	60.8
District banks	57.5	58.2	58.3	56.4	56.8	57.0
Nonperforming Loans/Total Loans						
All U.S. banks	3.17	3.22	3.44	3.75	4.02	4.04
U.S. peer banks	2.38	2.49	2.79	3.05	3.33	3.36
District banks	1.72	1.70	1.78	1.81	1.87	1.83
Nonperforming Loans/Capital						
All U.S. banks	30.9	31.1	33.3	36.2	37.8	37.1
U.S. peer banks	20.7	21.4	24.1	26.6	28.2	28.0
District banks	12.6	12.5	13.0	13.4	13.5	13.1

¹Annualized

²U.S. peer banks are those banks with assets of less than \$15 billion.

SOURCE: Reports of Condition and Income for all Insured Commercial Banks, 1990-91.

10 basis points from its June 1990 level.¹ The decline in ROA for U.S. peer banks, a group that excludes the nation's largest banks and includes banks of comparable size to District banks, was 7 basis points, indicating that the recession and real estate loan problems affected large banks more than small banks. District banks, as they usually do even in periods of economic stress, continue to record higher earnings ratios and smaller declines than their U.S. peers. The District's average ROA of 0.96 percent in June 1991 was down just 2 basis points from its June 1990 level and is very close to the industry benchmark of 1 percent.

District banks have performed relatively better than their U.S. peers despite significantly lower net interest margins (interest income less interest expense divided by average earning assets). Lower ratios of noninterest expense (overhead) and loan loss provisions (funds subtracted from earnings to cover expected loan losses) to assets are largely responsible for the higher returns on assets registered by District banks.

Net interest margins have risen modestly since early 1990 at all three groups of banks, as interest expense (the cost of deposits and other interest-bearing liabilities) has fallen more sharply than interest income (the revenue from loans and other investments). The group that includes all U.S. banks has experienced a larger increase than those recorded at U.S. peer and District banks, in part because the first group has a higher ratio of loans to assets than the other two. Since loan rates have decreased much less than rates paid on securities, net interest margins have risen more for banks with higher concentrations of loans in their portfolios. Increased net interest margins, which vary by region and size of bank, have cushioned, but not compensated for, the hit to earnings resulting from rising levels of nonperforming assets.

The most telling measures of the national downturn on bank performance are nonperforming loans as a percent of total loans and nonperforming loans as a percent of equity capital. Nonperforming loans are those loans that are 90 days or more past due or in nonaccrual status. Delinquent loans tend to rise during recessions as workers lose their jobs and fail to keep up with mortgage, credit card and other loan payments. Small businesses, which rely heavily on bank loans to fund inventory and expansions, also have trouble meeting their debts during recessions.

The ratio of nonperforming loans to total loans has risen steadily at all U.S. banks during the last year, increasing from 3.17 percent in March 1990 (before the recession) to 4.04 percent in June 1991. For this same period, the nonperforming loan ratio has also climbed for U.S. peer banks and District banks; however, the ratio rose 98 basis points for U.S. peer banks, but only 11 basis points for District banks.

The ratio of nonperforming loans to equity capital indicates how much owners' equity (absent any loan loss reserve, which is included in some measures of capital) would be depleted if all problem loans were written off. Nonperforming loans as a percent of equity capital for all U.S. banks rose from 30.9 percent in March 1990 to 37.1 percent in June 1991. U.S. peer banks experienced a similar increase, with the ratio rising about 7 percentage points during the period. The District bank average, in contrast, rose a meager one-half of a percentage point, from 12.6 percent in March 1990 to 13.1 percent in June 1991.

As with the ratio of nonperforming loans to total loans, the ratio of nonperforming loans to equity capital is substantially lower for District banks than for U.S. peer banks and all U.S. banks. District banks have been able to maintain a lower ratio of loan loss reserves to total loans than U.S. peer banks (1.66 percent vs. 2.23 percent in June 1991) because of lower nonperforming loan ratios. Nevertheless, District banks remain better "reserved" than their U.S. peers. District banks had about 91 cents in their loan loss reserve for every dollar of nonperforming loans in June 1991, while U.S. peer banks had 68 cents per dollar of nonperforming loans.

How Does This Recession Compare with Previous Downturns?

Although there have been some special factors at work, much of what has occurred in the banking industry recently is typical of recessionary periods. Loan demand falls when the economy slackens as consumers put off large purchases and businesses put expansion plans on hold. In addition, banks are more hesitant to extend loans in a downturn and adjust their asset portfolios toward the relative safety of securities.² Figure 1 illustrates this typical behavior for U.S. peer banks.

The contraction of bank credit in this recession has received much attention from the Bush Administration, bank regulators and the press, and has even been termed a "credit crunch;" yet, compared with prior periods, such a contraction is normal (see shaded insert on page 12). Since peaking in this expansion in the third quarter of 1989, the loan-to-asset ratio has declined just 2 percentage points at U.S. peer and District banks. During the double-dip recession of 1980-82, the loan-to-asset ratio declined 8 percentage points in the District and 5 percentage points at U.S. peer banks.

During recessions, bank earnings typically fall as loan delinquencies and losses rise and banks earn relatively lower returns from substituting government securities for loans in their asset portfolios. Figure 2 illustrates the cyclical earnings

Figure 1

Loans/Assets and U.S. Government Securities/Assets, U.S. Peer Banks 1978-91

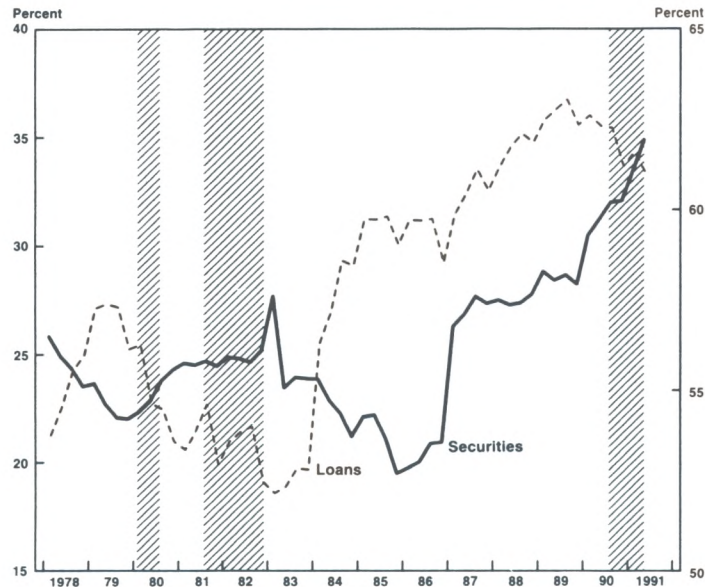
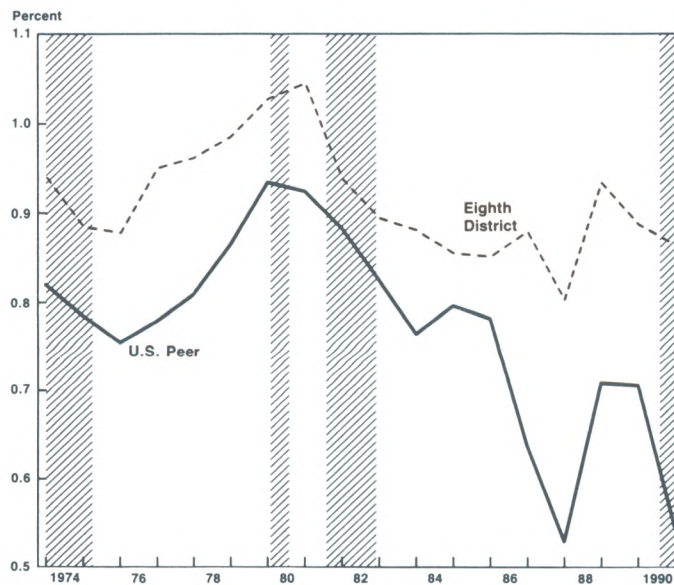


Figure 2

Return on Average Assets—U.S. Peer Banks vs. Eighth District Banks, 1973-90



pattern of the banking industry from 1973 to 1990. ROA for District and U.S. peer banks tends to decline during recessions and keeps declining for several quarters afterward as troubled loans are written off as losses. During the 1973-75 recession, for example, ROA declined 7 basis points at U.S. peer banks and 6 basis points at District banks. The earnings decline was even more pronounced during the 1980-82 recession, when ROA at U.S. peer banks declined from 0.93 percent in

1979 to 0.76 percent in 1983, and declined from 1.03 percent to 0.88 percent at District banks during the same time.³ After 1987, real estate-induced loan losses together with slowing economic activity contributed to earnings declines.

In contrast to earnings, nonperforming loans tend to decline when the economy grows and rise when the economy contracts. Similar to ROA, the nonperforming loan ratio worsened for all categories of banks shown in figure 3 for several quarters

Are We Caught in a Credit Crunch?

Declining employment and consumer confidence, which reduce demand for credit, together with declining creditworthiness of borrowers, combine to produce slow loan growth during recessions. Slow loan growth, however, is not the sole determinant of a credit crunch. A credit crunch occurs when creditworthy borrowers who demand credit are unable to get credit at prevailing interest rates.

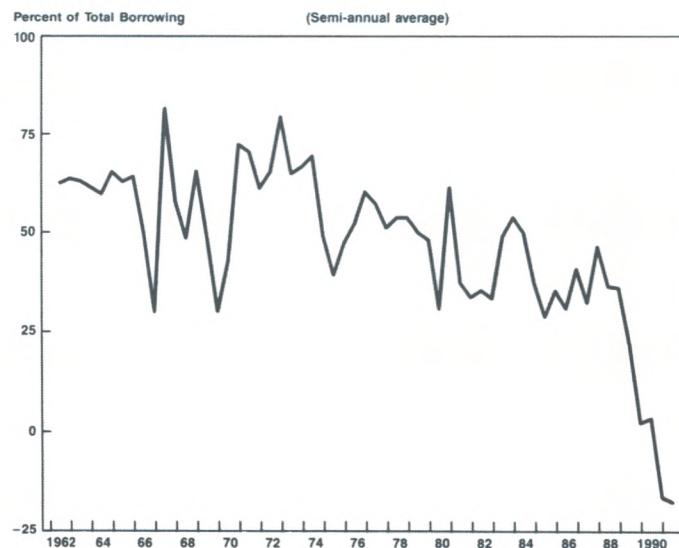
The available data on outstanding credit do not provide sufficient evidence to conclude that the nation is experiencing a credit crunch, because it is not possible to separate demand factors from supply factors. Anecdotal evidence from bankers and small businesses, especially in this District, does not support the claim that the economy is credit-constrained. Clearly, some industries in some regions are finding it difficult to obtain credit. Loans to support commercial real estate, and, in some cases, residential real estate construction, are difficult to obtain, especially in New England. New development is questionable, however, given excess commercial office space, reflected in high vacancy rates and slow sales of new and existing homes in most parts of the country. Thus, much of the credit

contraction to this industry can be explained in terms of the scarcity of profitable building opportunities.

Special factors, such as the need for some banks to raise their capital-to-assets ratios to meet new international risk-based capital standards, have also contributed to slow growth in assets, especially in loans. Rising losses in the banking industry have made it hard for banks to raise capital in the equity markets, and thus many have had to shrink their balance sheets to meet these new capital requirements. This trend, which has been dubbed the "capital crunch" by some New England economists, started before the economy went into recession and has exacerbated the normal contraction of credit in an economic downturn.¹

Another factor, illustrated in the figure, is the long-term trend of the declining importance of banks and thrifts in the extension of credit to non-financial companies. Large corporations are increasingly turning to nonbank sources for credit, such as the commercial paper market. In addition, increased securitization of assets (the pooling of assets such as loans into large bundles that are then sold as securities to the secondary markets) means some lending activity by banks may not be reported if the originated loans are sold quickly, and thus never (or briefly) appear on the balance sheet.

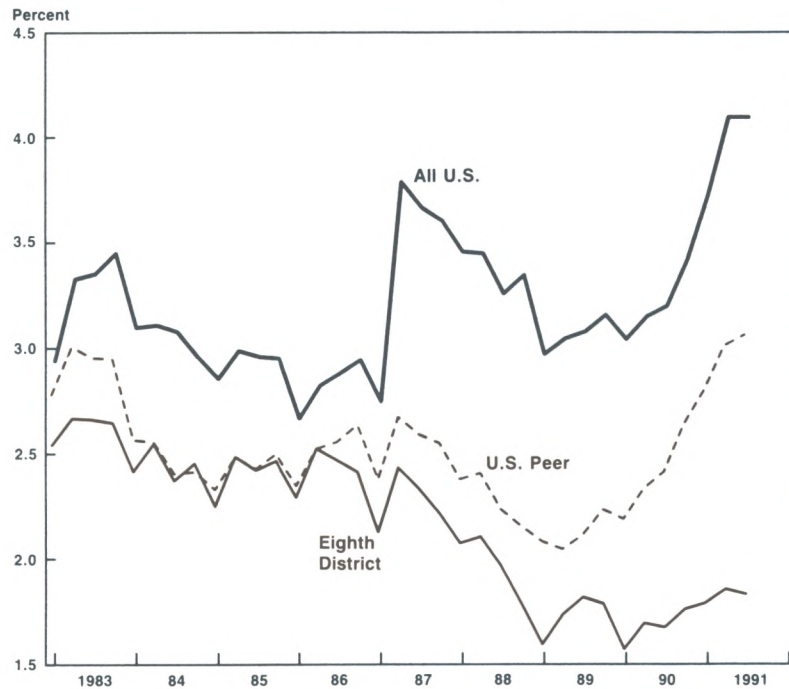
Funds Advanced by Commercial Banks and Thrifts Relative to Total Net Borrowing by the Domestic Non-financial Sector



¹See Richard F. Syron, "Are We Experiencing a Credit Crunch?" *New England Economic Review*

(July/August 1991), pp. 3-10, for a discussion of the New England capital crunch.

Figure 3
Nonperforming Loan Ratio, all U.S., U.S. Peer and Eighth District Banks



into the recovery period, and then began improving as the economy picked up steam. The ratio reached a maximum in early 1987 when many of the nation's largest banks, including some District banks, placed a large portion of their loans to Latin America in nonaccrual status.⁴ Beginning in 1987, the gap between the nonperforming loan ratio for District banks and all U.S. banks widened as problem foreign loans were replaced by troubled commercial and real estate loans in the Southwest and then troubled real estate loans in the Northeast. The significantly lower nonperforming loan ratios in the District during this recession, compared with the ratios recorded in the recession of the early 1980s, illustrate quite clearly how much better the Midwestern economy has fared during this recession, compared with the prior recession and compared with economies in other regions.

Conclusion

Bank performance is very dependent on local as well as national economic conditions. Eighth District banks have outperformed their national peers during this recession, largely because economic conditions have not deteriorated as much as they have elsewhere. In addition, slow loan growth in the District and the nation during this recession is not unlike that of previous recessions of the past

two decades. Although declining loan growth is symptomatic of a credit crunch, it is also a predictable outcome of declining economic growth. Without corroborating evidence, declining loan growth is insufficient evidence for a conclusion of a credit crunch. Weakened capital positions at banks in some regions of the country and a general decline in depository institution participation in the extension of credit to non-financial businesses provide other explanations for the slow growth in bank credit during the past two years.

¹Although the table clearly shows a downward trend in annualized ROA for U.S. banks throughout 1990 and from March 1991 to June 1991, quarter-to-quarter changes are suspect because of the timing of loan loss provisions, an expense item, which historically increase at year-end.

²Recent studies have shown that adjustments in bank asset portfolios precede changes in economic activity. See Cara S. Lown, "Banking and the Economy: What Are the Facts?" Federal Reserve Bank of Dallas *Economic Review* (September 1990), pp. 1-14.

³The sharp decline in ROA which occurred at U.S. peer banks, and to a lesser extent at District banks, in 1987 is due almost entirely to large loan loss provisions taken for loans to lesser developed countries.

⁴See Lynn M. Barry, "District Bank Performance in 1987: Bigger is Not Necessarily Better," Federal Reserve Bank of St. Louis *Review* (March/April 1988), pp. 39-48.

Eighth District Business

	Level	Compounded Annual Rates of Change			
		III/1991	II/1991- III/1991	III/1989- III/1990	1990 ¹
Payroll Employment (thousands)					
United States	108,950.0	0.4%	-1.1%	1.5%	2.6%
District	6,942.9	1.2	0.0	1.9	3.2
Arkansas	955.4	3.1	2.9	3.6	3.3
Little Rock	256.3	0.0	1.2	3.2	3.2
Kentucky	1,489.7	2.8	0.6	2.9	3.7
Louisville	488.7	2.3	1.6	2.7	3.7
Missouri	2,318.4	0.4	-0.8	1.1	2.5
St. Louis	1,169.4	-1.1	-1.1	0.9	2.3
Tennessee	2,179.4	0.3	-0.9	1.3	3.6
Memphis	477.2	-1.1	0.4	1.0	4.2
Manufacturing Employment (thousands)					
United States	18,418.0	0.4%	-3.6%	-1.7%	0.5%
District	1,450.2	2.8	-2.0	-0.1	2.2
Arkansas	236.7	3.9	1.4	0.7	2.1
Kentucky	282.6	1.6	-1.9	0.9	3.7
Missouri	418.7	2.5	-4.0	-0.8	1.6
Tennessee	512.1	3.2	-2.0	-0.3	2.1
District Nonmanufacturing Employment (thousands)					
Mining	48.5	-7.1%	-4.9%	2.0%	-3.8%
Construction	286.7	-3.0	-3.3	1.6	1.1
FIRE ²	339.0	-1.5	-0.3	0.6	0.7
Transportation ³	406.2	-2.3	-0.1	1.8	4.2
Services	1,620.8	1.4	2.0	4.5	5.8
Trades	1,631.2	-0.3	-0.3	1.0	2.5
Government	1,160.3	5.7	1.5	2.6	3.3
Real Personal Income⁴ (billions)					
	II/1991	II/1991- II/1991	II/1990- II/1991	1990	1989
United States	\$3,544.1	2.2%	-1.1%	1.1%	2.9%
District	195.1	1.2	-0.7	0.7	2.3
Arkansas	25.9	0.0	0.8	1.6	2.0
Kentucky	42.0	1.0	-0.9	1.7	2.7
Missouri	67.8	1.2	-1.6	-0.3	2.2
Tennessee	59.4	-2.0	-0.2	0.9	2.1
Levels					
	III/1991	II/1991	1990	1989	1988
Unemployment Rate					
United States	6.8%	6.8%	5.5%	5.3%	5.5%
District	7.1	6.7	5.8	5.8	6.5
Arkansas	7.6	7.5	6.9	7.2	7.7
Little Rock	6.5	6.3	5.9	6.3	6.4
Kentucky	8.2	6.8	5.8	6.2	7.9
Louisville	5.7	5.6	5.1	5.6	6.3
Missouri	6.8	6.8	5.7	5.5	5.7
St. Louis	7.0	6.8	5.9	5.5	5.9
Tennessee	6.5	6.0	5.2	5.1	5.8
Memphis	5.8	5.1	4.5	4.7	5.1

Note: All data are seasonally adjusted. On this page only, the sum of data from Arkansas, Kentucky, Missouri and Tennessee is used to represent the District.

¹Figures are simple rates of change comparing year-to-year data.

²Finance, Insurance and Real Estate

³Transportation, Communications and Public Utilities

⁴Annual rate. Data deflated by CPI-U, 1982-84 = 100.

U. S. Prices

	Level	Compounded Annual Rates of Change			
	III/1991	II/1990- III/1991	III/1990- III/1991	1990 ¹	1989 ¹
Consumer Price Index (1982-84=100)					
Nonfood	135.3	1.8%	5.0%	5.3%	4.7%
Food	136.9	3.9	4.1	5.7	5.9
Prices Received by Farmers (1977=100)					
All Products	152.0	16.5%	0.0%	1.6%	6.6%
Livestock	164.7	-5.4	-3.7	6.5	6.8
Crops	138.3	53.3	5.0	-4.8	6.6
Prices Paid by Farmers (1977=100)					
Production items	175.0	4.7%	2.9%	2.3%	6.4%
Other items ²	190.0	4.3	3.8	3.4	4.9

Note: Data not seasonally adjusted except for Consumer Price Index.

¹Figures are simple rates of change comparing year-to-year data.

²Other items include farmers' costs for commodities, services, interest, wages and taxes.

Eighth District Banking

Changes in Financial Position for the year ending September 30, 1991 (by Asset Size)

	Less than \$100 million	\$100 million - \$300 million	\$300 million - \$1 billion	More than \$1 billion
SELECTED ASSETS				
Securities	2.8%	13.4%	24.5%	16.9%
U.S. Treasury & agency securities	5.5	14.6	32.8	20.5
Other securities ¹	-6.5	9.6	1.2	6.1
Loans & Leases	1.0	3.4	2.8	3.5
Real estate	4.2	10.9	11.5	9.3
Commercial	-4.5	-10.0	-9.9	2.2
Consumer	-3.5	-2.8	0.3	-1.9
Agriculture	6.0	18.6	14.1	27.2
Loan loss reserve	12.1	10.4	11.5	20.7
Total Assets	2.0	7.5	7.8	11.9
SELECTED LIABILITIES				
Deposits	2.2%	8.0%	8.8%	14.1%
Nontransaction accounts	1.5	7.3	8.7	10.7
MMDAs	11.0	11.4	15.5	18.7
Large time deposits	-5.8	-7.8	-16.6	-27.8
Demand deposits	0.5	5.1	1.4	20.3
Other transaction accounts ²	7.9	15.4	18.9	24.5
Total Liabilities	2.0	7.3	7.7	12.1
Total Equity Capital	1.6	9.3	9.1	9.2

Note: All figures are simple rates of change comparing year-to-year data. Data are not seasonally adjusted.

¹Includes state, foreign and other domestic, and equity securities.

²Includes NOW, ATS and telephone and preauthorized transfer accounts.

Performance Ratios (by Asset Size)

	Eighth District			United States		
	III/91	III/90	III/89	III/91	III/90	III/89
EARNINGS AND RETURNS						
Annualized Return on Average						
Assets						
Less than \$100 million	.98%	1.08%	1.12%	.84%	.83%	.89%
\$100 million - \$300 million	1.08	1.03	1.09	.86	.95	1.03
\$300 million - \$1 billion	.96	1.03	1.06	.75	.79	.91
\$1 billion - \$5 billion	.98	.86	.42	.67	.59	.79
\$5 billion - \$15 billion	.78	.75	.84	.50	.44	.86
Agricultural banks	1.16	1.17	1.18	1.09	1.09	1.09
Annualized Return on Average						
Equity						
Less than \$100 million	10.73%	11.82%	12.25%	9.21%	9.13%	9.84%
\$100 million - \$300 million	13.09	12.65	13.43	10.75	11.78	12.87
\$300 million - \$1 billion	12.26	13.01	13.66	9.87	10.66	12.80
\$1 billion - \$5 billion	14.45	12.97	6.37	9.68	8.60	11.85
\$5 billion - \$15 billion	12.31	11.48	13.29	7.94	7.56	14.52
Agricultural banks	12.33	12.51	12.60	11.78	11.72	11.75
Net Interest Margin¹						
Less than \$100 million	4.34%	4.32%	4.36%	4.61%	4.63%	4.77%
\$100 million - \$300 million	4.33	4.28	4.42	4.68	4.70	4.87
\$300 million - \$1 billion	4.40	4.48	4.58	4.68	4.72	4.78
\$1 billion - \$5 billion	4.40	4.18	4.06	4.61	4.36	4.44
\$5 billion - \$15 billion	3.73	3.70	4.07	4.45	4.19	4.40
Agricultural banks	4.32	4.21	4.24	4.40	4.34	4.43
ASSET QUALITY²						
Nonperforming Loans³						
Less than \$100 million	1.76%	1.68%	1.68%	2.08%	2.05%	2.26%
\$100 million - \$300 million	1.92	1.84	1.74	2.27	2.05	1.98
\$300 million - \$1 billion	1.64	1.64	1.41	2.71	2.54	2.46
\$1 billion - \$5 billion	1.57	1.42	1.61	3.36	2.79	2.22
\$5 billion - \$15 billion	2.42	2.49	2.78	4.01	3.64	2.71
Agricultural banks	1.65	1.64	1.88	1.81	1.85	2.20
Loan Loss Reserves						
Less than \$100 million	1.62%	1.46%	1.48%	1.72%	1.66%	1.66%
\$100 million - \$300 million	1.60	1.50	1.46	1.68	1.50	1.47
\$300 million - \$1 billion	1.54	1.42	1.44	1.90	1.80	1.61
\$1 billion - \$5 billion	1.94	1.78	1.84	2.50	1.97	1.68
\$5 billion - \$15 billion	2.15	1.70	1.69	2.93	2.65	1.94
Agricultural banks	1.59	1.60	1.70	1.82	1.85	1.96
Net Loan Losses⁴						
Less than \$100 million	.35%	.27%	.25%	.42%	.39%	.46%
\$100 million - \$300 million	.42	.39	.34	.52	.45	.40
\$300 million - \$1 billion	.48	.39	.36	.68	.61	.52
\$1 billion - \$5 billion	.52	.61	.65	1.06	.80	.59
\$5 billion - \$15 billion	.84	.59	.59	1.31	1.20	.81
Agricultural banks	.28	.22	.28	.26	.29	.35

Note: Agricultural banks are defined as those banks with a greater than average share of agriculture loans to total loans.

¹Interest income less interest expense as a percent of average earning assets

²Asset quality ratios are calculated as a percent of total loans.

³Nonperforming loans include loans past due more than 89 days and nonaccrual loans.

⁴Loan losses are adjusted for recoveries.