FEDERAL RESERVE BANK OF ST. LOUIS

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REVIEW

CONTENTS

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A Primer on the Consumer Price Index

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HARDLY a day goes by without mention of the effects of inflation on the economic well-being of the average citizen, as a worker and as a consumer. Most references to inflation, in turn, are in terms of the consumer price index (CPI) and the way many prices, prominently led by food and petroleum products, have shot up in the last year and a half. The CPI is often cited by the media as a measure of changes in the cost of living. It is incorporated as an escalator in labor contracts covering over 5 million workers and is now used to adjust Social Security benefits for almost 29 million people. There is increasing talk of indexing all contracts to some measure of general prices, and the consumer price index presumably would play a role.

Given its wide use, and even misuse, it is important to understand the construction of the index and some of its major shortcomings. The stated intent of the builders of the index at the Bureau of Labor Statistics (BLS) is quite limited. The CPI is designed to measure changes in the average price of a representative sample of goods and services purchased by typical wage earners and clerical workers in urban areas in the United States. It is interpreted much more broadly, however.

The Mechanics of the CPI

In the jargon of economists, the consumer price index is a modified Laspeyres index. What this simply means is that the CPI measures changes in the total dollar cost of a specific combination of goods and services.[1] For example, if a person kept track, month to month, of the total dollar cost of buying a dozen Grade-A large white eggs, a one-pound loaf of white bread, and a 16-ounce box of cornflakes, the numbers would provide the basis for constructing a little index of food prices, much like the CPI. All that is left to do is divide the total cost in each month by the cost in the first month, to get a measure of the relative change in the cost. This is essentially the method used to construct an index like the CPI. The quantities of the goods and services are held constant, and the index measures the effect on total dollar cost of changes in prices of the components.

The first problem in constructing any price index is to determine the items to be priced and just how much of each to include in the bundle of goods. In the example above, the index might be interpreted as measuring the month-to-month changes in the total cost of breakfast foods. Should we also include sugar, fruit juice, coffee, or milk? Should we include bacon, or should it be sausage, and, if so, in what quantities? An index derived from a bundle containing three dozen eggs would be different from one containing only one dozen. Yet another series would result if oatmeal were substituted for cornflakes. One guide to the appropriate relative proportions, or weights, would be the actual amounts which comprise a "typical" breakfast. The index would then measure changes in the average price of a particular breakfast, instead of breakfast foods in general. The problem is to determine what makes up a "typical" breakfast.

One person probably would have little trouble with this problem, but constructing an index appropriate to the spending patterns of over 200 million people is very difficult. Consumers spend on a wide variety of items. Some items, like food, are bought regularly and immediately consumed, while others, like houses and automobiles, are bought irregularly and yield services over a long period of time. Some scheme for determining the relative quantities of each of these goods and services is required, and, if the index is to be useful as an aggregate measure of the prices of consumer goods, the relative amounts should be representative of those actually purchased in the economy.[2]

The method used in deriving weights for the CPI is based on periodic surveys of consumer spending pat-

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[1] A Laspeyres index is a fixed-weight index, where the weights are the relative quantities as of some base period. The formula for such an index is:

$$I_t = \Sigma p_t q_o / \Sigma p_o q_o$$

where I_t is the value of the index in the current period, p_t are the various component prices in the current period, p_o are the component prices in the base period, and q_o are the component quantities in the base period.

The formula actually used by the BLS is somewhat different, but algebraically equivalent. The index is constructed by a chain computational procedure, which can be written in simplified form as:

$$CPI_t = \Sigma p_o q_o \left(\frac{p_t}{p_o}\right) / \Sigma p_o q_o.$$

[2] Unfortunately no perfect means of determining the weights has yet been developed. For a presentation of some of the many schemes which have been suggested, see Irving Fisher, *Making of Index Numbers* (New York: Houghton Mifflin Company, 1922).

terns. These surveys were undertaken in 1917-19, 1934-36, 1950-51, 1960-61, and 1972-73.[3] The results of the 1972-73 survey, along with other major changes, are scheduled to be incorporated into the index in 1977.

The survey seeks to determine the proportion of consumer spending that is devoted to various kinds of goods and services. These proportions are then used to determine the relative importance of the various prices in the index. On the basis of the survey conducted in 1960-61, estimates were made that, on average, typical wage earners and clerical workers in urban areas devoted 22.4 percent of their spending to food, 33.2 percent for housing, 10.6 percent for apparel and upkeep, 13.9 percent for transportation, 5.7 percent for medical care, 2.8 percent for personal care, and 5.1 percent for other goods and services.[4] These are the weights that these various prices receive in the computation of the current consumer price index. The weights were introduced in January 1964 and have been held constant since.

Prices of over 400 separate items are currently used to construct the CPI. The list of items whose prices are sampled ranges from diapers through funeral services and includes such things as cornflakes, roof shingles, cough syrup, basketballs, and two-year-old Chevrolets and Fords. The prices are sales prices and thus include excise and sales taxes. In addition to the prices of commodities and services, the sample includes such items as real estate taxes on owned homes, utility rates, and mortgage costs. Income taxes are not included and neither are Social Security taxes. Trained representatives collect price quotations and the BLS uses strict statistical procedures for processing the data into the CPI.

[3]These surveys are conducted in numerous metropolitan areas. The 1960-61 survey was conducted in 66 Standard Metropolitan Statistical Areas and smaller cities. The sample included 4,343 urban families of two or more persons and 517 single workers. These single persons are not necessarily unmarried, but are classified as being financially independent. Of the areas included in the survey 56 are currently sampled for price movements. Population weights for these 56 areas are used to combine the data into a city average for the United States. This city average is reported as the CPI. Price indexes for some of the individual cities are also published. For more details on the survey procedure, see Marvin Wilkerson, "The Revised City Sample for the Consumer Price Index," *Monthly Labor Review* (October 1960), pp. 1078-83. Also see U.S. Department of Labor, Bureau of Labor Statistics, *BLS Handbook of Methods,* Bulletin 1711 (1971), pp. 59-67.

[4]These weights were introduced in January 1964 and were adjusted for changes in prices between the date of the survey and December 1963. The weights represent an estimate of how the typical urban wage earner would allocate a spending budget in December 1963 if the same items were bought as reported in the 1960-61 survey, but at the prices prevailing in December 1963.

Some Problems and Shortcomings

Construction of a price index as comprehensive as the CPI is a very complex, difficult, and expensive task. On the one hand are the statistical problems related to sampling and processing of data. Quotations on the prices involved in all transactions are almost impossible to record. Instead, samples are designed to yield results which have a high probability of representing price behavior. On the other hand are the conceptual difficulties, the most prominent being the handling of changes in the quality of commodities and services, and changes in people's tastes and preferences. The BLS is able to collect price quotations on automobiles, for example, but they are unable to price the services rendered by a car. It is the services of an automobile that are valued by consumers, however, not just the auto itself.[5] To take another example, how much more service, in dollars and cents, does a color television set yield compared to a black and white set? Even without this difference, there is the problem of changes in quality stemming from the programming policies of television networks and station owners. A decrease in the overall pleasure derived from a television set, either as entertainment or as a source of information, increases the cost of its services just like an increase in the dollar price of the set. It is impossible for anyone, other than an individual viewer, to measure objectively changes in the quality of a given commodity. A similar problem arises when new commodities are introduced.

A related problem is that the CPI is constructed as a fixed-weight index. Essentially, the CPI attempts to measure the percentage change in the amount that consumers would have to spend to purchase goods and services in the same quantities and of the same quality that they purchased when the survey was taken. Currently, the CPI measures changes in the dollar cost of items that the average urban consumer bought in 1960-61. It says nothing at all about the

[5]Consider a hypothetical case based on the mandatory safety devices now built into cars. To the extent that they are effective in reducing the probability of bodily injury, the services of automobiles are apparently increased. It is not clear, however, that the increase in the price of a car that these safety devices represent should be discounted as reflecting an increase in quality. Other things equal, effective safety devices will result in less injury in automobile accidents and, presumably, lower insurance premiums. The price of automobiles goes up and the price of insurance goes down. The result of treating the safety devices as increasing the quality of automobiles is a decrease in the index of the price of consumer goods and services. One would conclude, incorrectly, that the mandatory safety program had decreased consumer prices. In this example, all that actually happened was that the program tended to transfer resources from one industry to another, leaving average consumer prices unchanged.

relative quantities or quality of the bundle of goods that consumers actually buy today. It is in this context that the CPI is not an accurate gauge of changes in the cost of living.[6]

CPI and the Cost of Living

The CPI attempts to measure the cost of consumer goods to the "average" urban wage earner. Being an average, the price index is only a rough approximation of the prices paid by any one individual or family. Rising food prices, for example, get a weight of about 22 percent in the index, but this understates the effect of increases in food prices on the cost of consumer goods to low income groups who devote more than 22 percent of their spending to food. At the same time it overstates the effect on someone whose spending on food accounts for only 10 percent of their total spending.

An additional problem is that consumers do not spend their income in the same manner year after year. They do not buy the same kinds of things, or even if they do, they do not buy them in the same relative amounts. However, the CPI, as a fixed-weight index, is based on the presumption that consumer spending patterns change little over time. Thus the actual average price of consumer goods is not captured in the index.

What are the factors which determine the manner by which people allocate their income among various goods and services? The foundation of economic analysis is that people attempt to maximize their own well-being. That is, they behave so as to derive the most satisfaction from their limited resources. People buy things which they believe (not always correctly, since we do not have perfect information about the characteristics of all goods and services) will yield them the greatest satisfaction per dollar.[7] The decision is a very personal one, based on each individual's subjective valuation of things he or she likes best among the available alternatives. If resources were unlimited there would be no problem, as everyone could indulge himself to the limit of his ability to absorb the services being rendered. Resources are limited, however, and the most binding constraint on an individual is his ability to command goods and services – that is, his purchasing power.

Within the context of a given level of income and ability to borrow, a person must decide where his dollars will probably yield the most satisfaction. The factors which determine this choice are each individual's subjective valuation of various items, his income, and the price of each item relative to prices of other goods and services, as well as some expectations about future income and prices. Changes in individual tastes, income, relative prices, and expectations would alter the way that income is allocated among various commodities.[8]

We can get some feel for the way consumers change their spending patterns by comparing the proportion of spending devoted to the various classes of goods and services as reported in the 1960-61 survey of consumer spending to those of the 1950-51 survey. Table I shows the composition of spending reported in each survey since the mid-1930s.[9] There were substantial shifts in spending patterns, highlighted by a sharp reduction in the proportion of total purchases devoted to food, and large increases in the proportion going for transportation services, medical care, and reading and recreation. This does not mean that over the decade of the 1950s the average urban wage-earner decreased spending on foods and increased spending on the other items. Consumer spending for all goods and services increased 70 percent between 1950 and 1960. Spending for some items, like transportation, rose faster than spending on other items, like food. As a result the *proportion* spent on transportation rose and the *proportion* spent on food decreased.

For the entire interval from December 1952 through December 1963, the CPI was computed on the basis

[6]This shortcoming is recognized and emphasized by the Bureau of Labor Statistics, which continuously reminds readers in its publications that the CPI cannot be used as an estimate of current spending patterns or as an indicator of changes in consumer spending. Despite this persistent warning, however, the CPI continues to be so applied.

[7]Some people interpret this lack of information about product characteristics as justification for governmental intervention to prohibit "shoddy products" in the market. While no one wants to be disappointed in a product he buys, this argument fails to distinguish between purchases made in ignorance of a product's true quality and those made precisely because of "inferior" quality, and often associated lower price.

[8]The problem of comparing the satisfaction derived from consumption of a commodity today to the satisfaction derived yesterday is not trivial. To a style-conscious person it makes a great deal of difference whether last year's clothes are worn last year or this year. In the case of the CPI, this type of effect would be manifested, for example, in changes in the age-composition of the population. Presumably tastes change with age. For example, in 1973, the proportion of the population under the age of 25 was estimated at 44.9 percent, up sharply from the 35.6 percent estimated in 1960 when the survey of consumer spending was taken. See Franklin Fisher and Karl Shell, *Economic Theory of Price Indices* (New York: Academic Press, 1972).

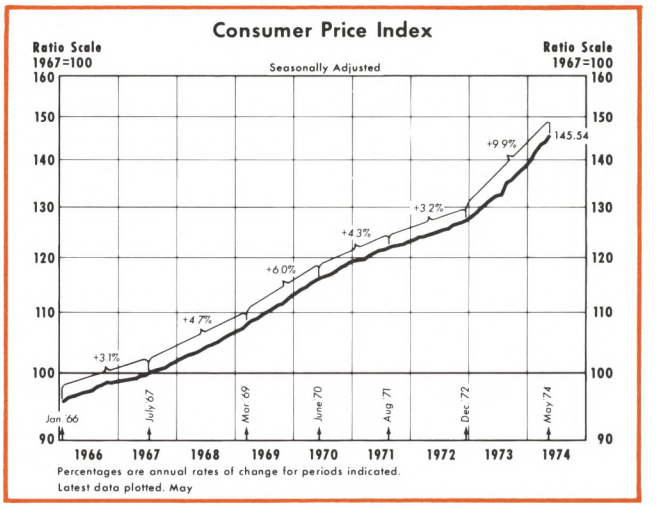
[9]The metropolitan areas sampled changed from survey to survey. In addition, some commodities were added and others were dropped from one survey to the next. Differences in the reported proportion reflect, in part, these changes, and not changes in consumer spending patterns.

Table I

Percentage Distribution of Consumer Expenditures

	1935-39 (based on 1934-36 survey)	December 1952 (based on 1950-51 survey)	December 1963 (based on 1960-61 survey)
Food	35.4%	29.6%	22.4%
Housing	33.7	32.5	33.2
Apparel & Upkeep	11.0	9.2	10.6
Transportation	8.2	11.3	13.9
Medical Care	4.0	5.1	5.7
Personal Care	2.4	2.0	2.8
Reading & Recreation	2.9	5.3	5.9
Other Goods & Services*	2.4	5.0	5.1

*Includes tobacco products, alcoholic beverages, and personal expenses such as funeral, bank, and legal services.



of weights determined in the 1950-51 survey.[10] In terms of the way people purportedly allocated their expenditures on commodities in the 1960-61 survey, changes in food prices had a smaller effect on their spending budget in late 1963 than reported in the CPI, and all other nonfood components were more important than reported in the CPI.

Changes in the price of food had an exaggerated effect on the CPI, but it is impossible to determine just when in the 1950-60 period consumer spending patterns between food and other commodities changed. The pattern of spending could have changed slowly over the period. However, the change might have come very soon after the survey was taken, for the 1950-51 period was marked by "scare-buying," as consumers sought to stockpile various commodities in anticipation of price controls and rationing. The Korean War had just started and the memories of the World War II experience were fresh. Alternatively, the change in spending patterns might not have come until 1960-61 when the new survey was taken. Whereas consumer spending was rising rapidly in 1950-51, the economy was in a recession during the 1960-61 period, with unemployment rising to 7 percent of the labor force. This would be expected to have an effect on the way consumers spend.

The effect of this weighting problem on the index can be seen by comparing the estimated consumption patterns in 1963 from the 1960-61 survey, with those implied by the CPI based on the 1950-51 survey.[11] If, in December of 1963, consumers would have bought goods and services in the same quantities and of the same quality as they had in 1950-51, the bundle would have cost 15.6 percent more than it did in December 1952. At December 1963 prices, food would have accounted for 28.2 percent of total spending, 30.7 percent would have gone for housing, 10.6 percent for apparel and upkeep, 11.6 percent for transportation, and 18.1 percent for health and recreation. Comparing these implied numbers to those of the 1960-61 survey reported in Table I we can see that the CPI overstated the influence of food prices on household budgets and understated the importance of all other types of consumer goods.

The problem stems from the fact that the CPI, as a fixed-weight index, cannot account for changes in *relative* prices. A fixed-weight index presumes that the composition of their spending remains unchanged as relative prices change. When some prices rise faster than others, however, people substitute consumption of some items for others. There is no way, other than frequent surveying, to determine the extent to which

[10]Prior to January 1953, the CPI was based essentially on weights determined in the 1934-36 period. Some interim adjustments were made during World War II and in the early Korean War period. The 1950-51 survey served as the basis of the CPI from January 1953 to December 1963. The 1960-61 survey has been used since, and is not scheduled to be replaced by the results of the 1972-73 survey until 1977.

[11]The CPI is not a measure of the price *level*, but instead is a measure of changes in the level of prices from some arbitrarily selected reference point. This presents a special problem when the Bureau of Labor Statistics introduces the results of new surveys and changes the weights. They must decide a reference point from which to compute changes in prices using the new weights. The procedure they use is to link the new series to the level of the CPI of the month prior to the weight revision. There is no reason to assume that this is the appropriate price *level*. In fact, comparison of the 1960-61 survey data and the relative importance in December 1963 shows clearly that it is not. Thus while a fixed-weight price index loses economic meaning when relative prices change, periodic weight revision to account for the changes in relative prices destroys the validity of the CPI as a statistical time series.

people are willing or able to switch their consumption patterns when some prices change relative to others.

From 1963, when the current weights were introduced into the consumer price index, until 1973, the consumer price index increased about 45 percent. Over that same period per capita after-tax personal income in the country increased by about 96 percent.[12] The difference in these two magnitudes represents the gain in "real income" per person over the decade, as suggested by the CPI. Such an increase in real income would be expected to generate substantial shifts in the spending patterns of the average American. For example, as income increases rapidly, the demand for "necessity" items such as food would not be expected to increase as fast as the demand for some other items. "Luxury" goods, such as recreational vehicles, become increasingly attractive to families, either because of higher incomes or because of a shift in preference toward more active leisure. A fixed-weight index does not account for these shifts.

CPI and the Value of the Dollar

In the words of the BLS, "The [consumer price] index represents price change for everything people buy for living . . . ."[13] If the statement of the BLS is interpreted literally, the CPI is intended to measure changes in the value of money. After all, prices are just exchange rates between money and other assets, including goods and services; if the CPI captures the average change of all prices, it necessarily would serve as a gauge of change in the purchasing power of money.

An index of the purchasing power of money would have to be all inclusive; that is, it would have to account for the prices of all things that can be exchanged for money. The list would include, in addition to goods and services, bonds, stocks, and investment goods. The CPI, which incorporates only prices of current consumer goods, is far short of incorporating a sufficient number of prices to be used as a measure of the purchasing power of money.

One must keep in mind that people do not only make decisions about what to consume today, but they also make plans for consumption tomorrow and years into the future. People can and do trade-off between consuming today and making provisions for consuming tomorrow. Eating a meal at a restaurant is current consumption. Buying a house, setting up a college fund for the children, and contributing to a retirement plan reflect plans to consume in the future. For the most part, the prices of assets which represent future purchasing power are not included in the CPI.[14]

What are the assets that people can buy today in order to consume tomorrow? The most obvious are durable goods, such as home appliances, automobiles, houses, and clothes. These all yield continuing service and can be bought today for consumption in the future. Many of these items are included in the CPI, but many others are not. Excluded from the index are financial assets, such as bonds, savings accounts, pension plans, and retirement funds. While they yield little direct service through ownership, they can be exchanged in the future for dollars, which in turn can be exchanged for goods and services. In considering the purchasing power of money, we must take account of the amount of future dollars that a dollar will buy today.[15] Many of these assets are not included in the CPI and, therefore, it is not a good measure of the purchasing power of money.

CPI and the Causes of Inflation

A fixed-weight index, like the CPI, is particularly susceptible to misinterpretation during short periods when the prices of some of the component parts change dramatically.[16] Analysis of economy-wide developments requires a price index which measures changes in the average prices being paid in the economy. When some relatively autonomous event, like the recent oil embargo or the increase in the Russian demand for our grain, contributes to intense pressure on prices in a few markets, the CPI incorrectly trans-

[12]This includes all persons, in addition to urban wage earners and clinical workers.

[13]Bureau of Labor Statistics, *Handbook of Methods*, p. 76.

[14]There is no guarantee that a person will be able, in the future, to buy as much as was planned. If prices increase faster than expected, purchasing power will be less than anticipated. We know nothing about what prices will actually be in the future. We are limited, instead, to the effect today of expected future prices. Armen A. Alchian and Benjamin Klein, "On a Correct Measure of Inflation," *Journal of Money, Credit, and Banking, Part I* (February 1973), pp. 173-91.

[15]It is popular to deflate the money stock by the CPI to get a measure of the amount of "real money balances" in the economy. On this basis, real money balances have declined over the past year. It is interesting to construct a similar series where the money stock is deflated by the market price of Aaa-rated corporate bonds. The picture is very different. This latter series admittedly is arbitrary, but is it any more so than the series using the CPI? See "Real Money Balances: A Misleading Indicator of Monetary Actions," this *Review* (February 1974), pp. 2-10.

[16]Everyone who deals with data should be aware of the pitfalls. For a sobering discussion of the problems, see Oskar Morgenstern, *On the Accuracy of Economic Observations* (Princeton: Princeton University Press, 1963).

Table II

Sources of Recent Changes in the CPI[1]

(Major Expenditure Classes and Selected Sub-Components)

	Annual Rates of Change		Sources of Changes in CPI[2]	
	12/72-12/73	12/73-5/74	12/72-12/73	12/73-5/74
CPI (All Items)	8.8%	12.7%	100.0%	100.0%
Food at home	22.1%	14.7%	43.9%	22.7%
Cereal and bakery products	28.8	27.5	7.1	3.5
Meats, poultry & fish	26.4	—10.1	18.0	—5.6
Dairy products	22.5	16.8	6.9	4.0
Fruits and vegetables	14.1	62.1	4.8	15.4
Other	17.5	17.8	7.1	5.4
Food away from home	12.7	10.5	7.2	4.3
Housing	7.2	12.4	27.7	32.5
Fuel & utilities	11.5	23.9	6.2	9.1
Transportation	4.5	21.9	6.7	21.7
Gasoline	19.7	72.1	6.0	16.7
Apparel and upkeep	4.4	8.5	5.2	6.7
Medical care	5.2	10.1	3.8	5.0
Personal care	6.3	10.9	1.8	2.2
Reading & recreation	2.9	8.5	1.9	3.6
Other	3.8	5.8	2.2	2.2
Commodities	10.4	14.7	73.9	73.4
Durable	2.4	10.6	4.5	13.0
Non-durable	13.3	16.1	69.4	60.4
Services	6.2	9.6	26.1	26.6

[1]Not seasonally adjusted

[2]The proportion of the change in the CPI due to changes in the prices of particular components. For example, increases in the prices of housing services between December 1972 and December 1973 accounted for 27.7 percent of the rise in the CPI over that same period.

lates these individual price increases into general increases in the average price of consumer goods.

We know that the amount of food items, like beef, that consumers purchased last year decreased as the price of beef rose. The rise in the CPI reflected the increase in beef prices, but not the decrease in the amount of beef purchased. As beef prices rose, people switched to other food sources. The same phenomena occurred in the markets for gasoline and other petroleum-based fuel. Total consumption of refined petroleum products in the United States decreased by 7.4 percent from October 1973 to March 1974. This decrease in quantity was not captured in the CPI, which held the quantity constant. The rapid increases in oil prices were added in with fixed weights.

Inflation, as a persistent increase in the average level of prices, is everywhere a problem of excess aggregate demand, stemming from any of a number of sources. The huge increase in the demand for grain by the Russians, while manifested directly in the general food market, is better analyzed, for purposes of looking at inflation, as contributing to growth of aggregate demand. To the extent that demand was not curtailed in some other market, pressure was put on the aggregate price level. The increase in the price of food reflected the response *in the market for food* to this increase in aggregate demand. The rise in food prices no more *caused* the inflation than a crowing rooster causes the sun to rise.

If one falls into the trap of considering food prices, or oil prices, or automobile prices as causes of inflation, the logic of the position leads to the conclusion that the way to stop inflation is to decree that henceforth these individual prices shall not rise — if you do not want the sun to come up, shoot the rooster.

Conclusion

The major economic problem of the day is inflation. The only proven permanent cure for this problem is a program designed to keep the growth of aggregate demand in line with productive capacity. Some might argue that such an approach is "all right in theory, but it does not work in practice." This position, though logically absurd, is understandable, given the wide circulation of the notion that our inflation is caused by special factors, such as the oil embargo.

It is an easy matter to compute the portion of the rise in the CPI that was due to increases in food prices, or oil prices. It is also easy, but incorrect, to take one further step and say that the increases in, say, food prices accounted for 44 percent of the inflation. The prices of the components can cause the price *index* to rise, but that says nothing about the causes of inflation.

If shortcomings of the CPI are kept in mind, it can serve as a gauge of price pressure in a significant portion of the economy. It does not tell us *why* prices are rising, just that some of them are going up. Our current inflation is little different from those of the past, except that it has been allowed to continue longer. Responsible action to keep aggregate demand in check has been and still is the only answer.

Income and Expenses of Eighth District Member Banks – 1973

WILLIAM LEPLEY

NET INCOME of the 431 Federal Reserve member banks in the Eighth District rose by 9.8 percent in 1973, substantially higher than the 3.5 percent increase that occurred in 1972. This increase in Eighth District net income compares with increases for all member banks in the nation of 17.3 percent in 1973 and 7 percent in 1972. The total operating income of member banks in the District rose by 28.2 percent during the past year, while total operating expenses increased at an even faster rate of 31.4 percent. The comparable figures for member banks in the nation were 33.1 percent and 36.6 percent, respectively.

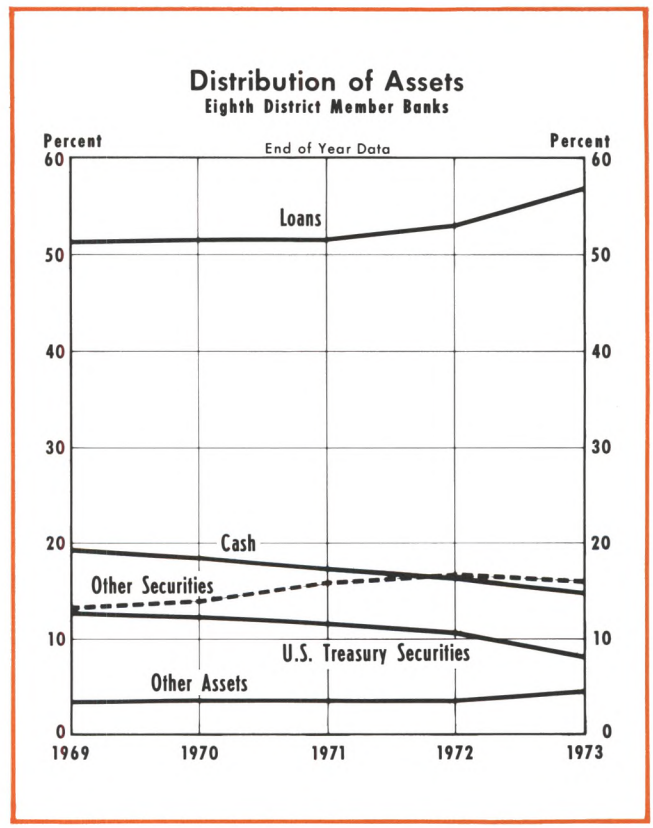
Many of the income and expense items increased substantially in 1973. These figures should be considered in light of the monetary expansion, the high inflation rate, and the rising interest rates which occurred in 1973.

Operating Income

Total operating income is largely determined by investments in various earning assets and the rates of return realized on these assets. Loan income makes up the largest portion of bank revenue. Various security holdings, trust services, service charges on deposit accounts, and other miscellaneous items provide the remaining sources of income.

Income from loans, including that resulting from Federal funds sold and securities purchased under agreements to resell, increased faster than all other categories of operating income in 1973 (see Table I). Receipts from loans increased by 37.5 percent in 1973, following the 10.6 percent increase of 1972.

One reason for the gain in loan income was the larger share of loans in the asset structure. While total assets rose by 12.9 percent during the year, the amount of total loans increased by 21 percent. As indicated in the accompanying chart, loans as a percentage of total assets increased from 53.1 percent in December 1972 to 56.9 percent in December 1973.



The rates of change of the major loan classifications varied substantially. The loan category which showed the most dramatic growth was Federal funds sold and securities purchased under agreements to resell – it increased by 56.4 percent during 1973 and constituted 8.1 percent of total assets at year end. The largest type of loans, commercial and industrial, registered an 18.9 percent increase in outstandings and accounted for

Table I

INCOME AND EXPENSES OF MEMBER BANKS IN THE EIGHTH FEDERAL RESERVE DISTRICT

	Thousand of Dollars			Percent Change	
	1973	1972	1971	1972-73	1971-72
Total Operating Income	**$1,308,395**	**$1,020,897**	**$ 928,050**	**28.2%**	**10.0%**
Income from Loans	904,126	657,650	594,496	37.5	10.6
Income from Securities	272,919	246,254	224,528	10.8	9.7
U.S. Treasury Securities	109,954	107,766	110,720	2.0	– 2.7
Other	162,965	138,488	113,808	17.7	21.7
Trust Department Income	29,067	26,568	23,651	9.4	12.3
Service Charges on Deposit Accts.	29,484	27,947	27,051	5.5	3.3
Other Operating Income	72,799	62,479	58,326	16.5	7.1
Total Operating Expenses	**$1,091,358**	**$ 830,449**	**$ 735,365**	**31.4**	**12.9**
Salaries, Wages, and Benefits	242,195	214,332	197,840	13.0	8.3
Interest on Deposits	457,682	351,679	307,833	30.1	14.2
Other Interest Expenses	135,681	46,593	37,469	191.2	24.4
Other Operating Expenses	255,800	217,844	192,222	17.4	13.3
Income Before Income Taxes and Securities Gains (or Losses)	**217,037**	**190,448**	**192,686**	**14.0**	**– 1.2**
Less Applicable Income Taxes	48,658	43,360	51,276	12.2	– 15.4
Income Before Securities Gains (or Losses)	**168,379**	**147,089**	**141,410**	**14.5**	**4.0**
Net Securities Gains (or Losses) After Taxes	311	5,371	5,876	– 94.2	– 8.6
Extra Charges or Credits After Taxes	– 738	605	498	– 122.0	21.5
Less Minority Interest in Consolidated Subsidiaries	20	85	26	– 76.5	226.9
Net Income	**167,932**	**152,979**	**147,758**	**9.8**	**3.5**
Cash Dividends Paid	60,277	56,762	61,266	6.2	– 7.4
Number of Banks	431	430	432	0.2	– 0.5

NOTE: The boundaries of the Tenth Federal Reserve District were expanded on January 24, 1972 to include several counties in western Missouri which had been in the Eighth Federal Reserve District. The income and expense data for 1971 have been adjusted to conform to the January 24, 1972 revision in district boundaries.

16.2 percent of total assets. Loans to individuals for personal expenditures were up 12.4 percent from the previous year, while all real estate-secured loans experienced a 22.5 percent increase.

The average rate of return on loans increased substantially during 1973, another reason for the gain in loan income. The average return was 8.67 percent, up from 8.09 percent in 1972.

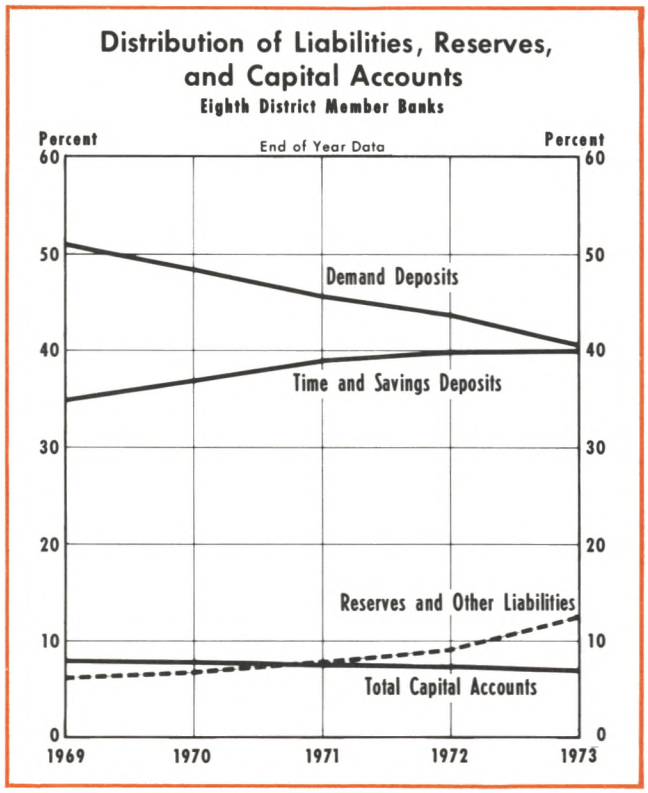
Income from securities also boosted the banks' total revenue. While income from all securities increased 10.8 percent in 1973, most of this increase resulted from securities other than those of the U.S. Treasury. These "other" securities, including obligations of states and political subdivisions, have increased in importance in the asset structure in recent years. The average return on U.S. Treasury securities increased from 5.69 percent in 1972 to 6.23 percent last year. The obligations of states and political subdivisions earned an average rate of 4.25 percent in 1973, up from 4.14 percent in 1972.

The remaining sources of income all increased over their 1972 amounts, but accounted for much less of total operating income. Trust department income increased 9.4 percent, service charges on deposit accounts increased 5.5 percent, and other operating income increased 16.5 percent. Taken together, these three categories accounted for only 10 percent of total operating income in 1973.

Operating Expenses

Total operating expenses rose by 31.4 percent in 1973 to almost $1.1 billion. The largest expense category was the interest paid on deposits. This item represented 41.9 percent of total operating expenses in 1973. Interest payments on deposits increased 30.1 percent during 1973 as a result of higher average rates paid as well as greater volume.

There has been an upward trend in the ratio of time and savings deposits to total deposits in recent years, which partially explains the increasing interest expense on deposits. At year end 1973, time and savings deposits made up 49.6 percent of total deposits, having increased from 47.7 percent in December 1972. Furthermore, regulatory changes in 1973 permitted higher interest payments on some types of deposits. On July 1, maximum rates were raised on certificates of deposit less than $100,000 and interest ceilings were



suspended for certificates of deposit in minimum denominations of $1,000 with maturities of at least four years. A maximum rate of 7¼ percent was imposed on the latter type of deposit on November 1. In addition, maximum rates on all time deposits of $100,000 or more were phased out during the year. Consequently, the average rate paid on time and savings deposits increased from 4.78 percent in 1972 to 5.07 percent in 1973.

The largest percentage increase among the expense items in 1973 was the 191.2 percent increase in "other" interest expenses. The most significant part of these expenses was the cost of Federal funds purchased and securities sold under agreements to repurchase, which almost tripled from 1972 to 1973.

Remaining classifications of expenses grew at relatively slower rates. Salaries, wages, and benefits increased 13 percent, and all other expenses, which includes such items as occupancy, furniture and equipment, depreciation, and provision for loan losses, increased 17.4 percent.

Net Income

The result of these changes in revenues and expenses for the Eighth District member banks was an increase in income before taxes and securities gains of $26.6 million, or 14 percent over the 1972 figure. This compares with a 17.3 percent increase in this item for all member banks in the nation. Although total operating expenses rose at a slightly faster rate than total operating income in 1973, the absolute increase in operating income was sufficiently large to cause an increase in income before taxes and securities gains. After higher income taxes, lower after-tax gains on securities, and extra charges, net income increased 9.8 percent to $168 million in 1973.

Bank Capital

Capital of the member banks in the Eighth District consists primarily of equity capital. Capital notes and debentures accounted for only 4.6 percent of total capital accounts as of December 1973. For the year ending December 1973, equity capital rose 8.2 percent and capital notes and debentures increased 5.7 percent, resulting in an increase of 8.1 percent in total capital accounts. Net income as a percentage of equity capital increased slightly, from 11.3 percent in 1972 to 11.5 percent in 1973.

Branching, Holding Companies, and Banking Concentration in the Eighth District

GERALD P. DWYER, JR., and WILLIAM C. NIBLACK

BANK expansion through branching and bank holding company acquisitions has been the subject of nationwide discussion in recent years. Pressure has come from larger banks for fewer restrictions on branching and bank holding companies. The smaller banks have generally resisted such pressure and at the same time have pressed for greater restrictions on bank holding companies. Both groups have been active in the Eighth Federal Reserve District, as indicated by a number of recent changes in state laws.

The often-heated debates about branching and multiple bank holding companies are concerned with the effect of these multi-office organizations on banking structure – the number and size distribution of banking organizations in an area. Of particular interest is the effect on concentration – the extent to which bank deposits are held in a few relatively large banking organizations in a market or a state.

The debate, however, is fundamentally about the effects of increased concentration. Those who favor branching or bank holding company expansion typically argue that any increase in concentration results from greater efficiency of these multi-office organizations and leads to improvement in services. One proponent of multi-office banking noted that in one state with state-wide branch banking:

> . . . there was no evidence of damage when a tiny, small-town bank, unable to pay the costs of automating and updating its facilities, unable to provide new customer services, unable to increase its lending limits and obtain funds at competitive rates, unable to attract and train top-notch bankers, agrees — or asks for — a merger with a large institution.[1]

On the other hand, opponents of multi-office banking argue that it results in a concentration of economic and political power, to the detriment of the public. As one opponent of multi-office banking put it:

> Today we are once again threatened by superconcentrations of economic and political power. . . . Such institutions, among them the multi-office giants of banking, have grown away from the people, are no longer responsive to the individual. It's "the public be damned," all over again.[2]

This article examines banking structure in Eighth District states, emphasizing concentration in states and Standard Metropolitan Statistical Areas (SMSAs). The effects of regulation – especially regulation of branching and holding company activity – on banking concentration are considered. Then, the effects of concentration on bank performance are analyzed.

REGULATION AND BANKING STRUCTURE IN EIGHTH DISTRICT STATES

Bank structure can be directly affected by regulation of entry, mergers, branching, and acquisitions of banks by multiple bank holding companies. Since state restrictions on entry and merger do not differ significantly in the Eighth District, one would expect to see little difference in bank structure among the states due to entry or merger laws. On the other hand, Eighth District state laws concerning branching and multiple bank holding companies differ considerably and may therefore contribute to differences in banking structure among the states.[3] Less restrictive regulation of branching and holding companies can affect structure by resulting in more branches or subsidiary banks and fewer independent banks. On the other

[1]Address of Walter J. Charlton to the Illinois Manufacturers Association, reprinted in *American Banker* (April 29, 1974).

[2]Fred T. Brooks, "Independent Banking: A Hometown Philosophy," *The Independent Banker* (November 1973), p. 6.

[3]The Appendix to this article provides some details of the regulations on entry, merger, branching, and multiple bank holding companies in each of the Eighth District states.

hand, it is also possible that branch banks or holding companies can increase the number of banking organizations operating in an area by establishing *de novo* branches or banks in an area in which they did not previously operate.

Branching Regulation and Structure

Illinois and Missouri are unit banking states, as was Arkansas until 1972. Arkansas now allows limited branch banking, as do the remaining states in the Eighth District.[4] There is no state-wide branching in the District.

Table I

ENTRY AND MERGERS IN EIGHTH DISTRICT STATES
(December 31, 1968-December 31, 1973)

	Change in Number of Banks	New Banks	Bank Mergers	Closing Banks	Ratio of Number of Mergers to Number of New Banks
Unit Banking States					
Arkansas*	8	8	0	0	0
Illinois	95	102	5	2	0.04
Missouri	19	22	2	1	0.09
Limited Branch Banking States					
Indiana	—5	7	12	0	1.71
Kentucky	—3	6	10	1	1.66
Mississippi	—4	12	16	0	1.33
Tennessee	18	19	1	0	0.05

*Arkansas is treated as a unit banking state since it did not allow branching until 1972.
Source: *Annual Report*, Federal Deposit Insurance Corporation, 1969-1972.
1973 data obtained from FDIC.

Effect of Branching on Entry and Merger — Opponents of branching argue that branching will result in a reduction in the number of independent banking organizations. This is likely to occur partly because branches will be opened where new banks might be established if branching were prohibited, and partly as a result of bank mergers. Such mergers are less likely to occur in unit banking states because the office of one bank would have to be closed or services offered at one office restricted.

In recent years the limited branch banking states in the Eighth District have had fewer new banks established and more mergers than the unit banking states. As indicated in Table I, the ratio of the number of mergers to the number of new banks from 1968 to 1973 ranges from zero to 0.09 for the unit banking states and from 0.05 to 1.71 for limited branch banking states. The number of banks increased in the three unit banking states and in one limited branch banking state, Tennessee, and decreased in the three other limited branch banking states.

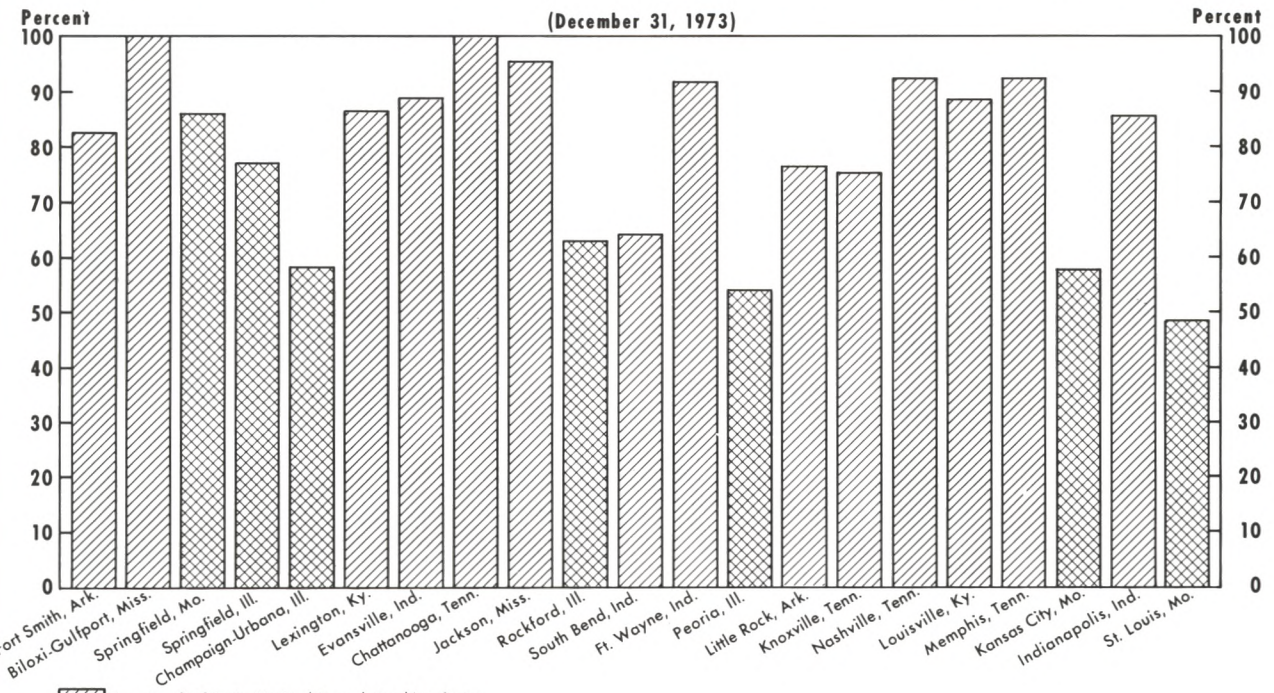
Effect of Branching on SMSA Concentration — This decreased entry and greater frequency of mergers has resulted in a greater concentration of deposits in branch banking states than in unit banking states. High concentration is especially likely for areas smaller than states, if branching is limited to such areas. As the accompanying chart shows, the concentration of bank deposits in Eighth District SMSAs is greater in limited branch banking states than in unit banking states. The SMSAs included in the chart are the four largest SMSAs with population greater than 100,000 in each Eighth District state, except for Chicago which is excluded as atypical. The concentration measure used is the "four-bank concentration ratio" — the percentage of total bank deposits in an area held by the four largest banking organizations. Since SMSAs can be taken as approximations of market areas for many banking services, the concentration ratios can be interpreted as market concentration ratios.[5]

The amount of business in a market also influences concentration; as the amount of business expands, the concentration of deposits generally declines. This can be seen most easily in a highly simplified example. Suppose there is a size of bank that is associated with minimum average cost and that entry is not regulated. Because of competition among existing firms

[4]In unit banking states a bank may not have full-service branches, although one or more limited-service facilities may be permitted within a limited distance from a bank's home office. In limited branch banking states, a bank may have more than one full-service office but may not operate full-service offices at locations throughout the state. Arkansas is regarded as a unit banking state in the analysis that follows, since it was classified as such for four of the five years under consideration.

[5]Banking markets are likely to be confined geographically because of the costs of visits to a bank. Only banks in a limited area are likely to be relevant alternatives for many customers. Various factors considered in defining SMSAs, such as commuting patterns, suggest that they are integrated economically. SMSAs as defined in 1970 are used with one change: parts of SMSAs that are not in the same state as the central city in the SMSA are excluded. For example, only the deposits in banks located in the Missouri portion of the St. Louis SMSA are included in calculating the concentration ratio for St. Louis. One reason for doing this is that banks across a state line are likely to be less relevant alternatives for bank customers. For example, it may be more difficult to get a loan across a state line because costs associated with filing mortgages and repossession in another state would be greater.

Percentage of Deposits in SMSAs Held by Four Largest Banking Organizations



Note: SMSAs are based on 1970 definitions; only counties in the same state as the central city are included. For example, based on the 1970 definition, the St. Louis SMSA included the city of St. Louis and four counties in Missouri, and two counties in Illinois. For this study, the two Illinois counties were excluded.

and entry of new firms, the average size of firms tends to be that which is associated with minimum average cost. Therefore, as a market expands new firms enter and concentration falls. The SMSAs in the accompanying chart are arranged on the basis of population — a rough measure of market size — with the smallest on the left and the largest on the right. The four-bank concentration ratio tends to be lower in larger SMSAs than in smaller ones. For areas of approximately the same size, concentration is higher in the limited branch banking states than in the unit banking states.

Multiple Bank Holding Company Regulation and Structure

Most states in the Eighth District prohibit the formation of new multiple bank holding companies or the acquisition of additional banks by any existing holding companies. At present, only Missouri and Tennessee allow formation of multiple bank holding companies or further acquisitions by them. Recent legislation in Tennessee prohibits acquisitions by multiple bank holding companies under certain circumstances. Legislation designed to restrict the size of multiple bank holding companies has also been enacted in Missouri. Both laws reflect concern over increased state concentration of bank deposits.

Recent Activity — In the last five years, the number of multiple bank holding companies has increased substantially in Missouri and Tennessee. In Missouri, there were 3 such companies at the end of 1968 and 24 at the end of 1973; in Tennessee, there were 3 at the end of 1968 and 9 at the end of 1973. The number of banks in Missouri controlled by these holding companies at year-end 1973 was 144, 12 times the number of banks controlled at the end of 1968. Holding companies in Tennessee now control 48 banks, more than 5 times the number of banks controlled at the end of 1968. Acquisitions of existing banks account for the majority of the increase in subsidiary banks, but 7 banks in Missouri and 1 bank in Tennessee were chartered as *de novo* subsidiaries.

The shares of bank deposits in Missouri and Tennessee controlled by multiple bank holding companies

have increased dramatically in the last five years. These companies controlled 9.4 percent of total Missouri bank deposits in 1968 and 55 percent in 1973. In Tennessee, they controlled 3.5 percent of total bank deposits in 1968 and 49 percent in 1973.

However, examining the effect of multiple bank holding companies on the share of state deposits in this way overstates the increase in the share of state deposits controlled by large organizations. The deposits in Missouri and Tennessee that are controlled by holding companies consist largely of deposits in the companies' lead banks. At year-end, deposits in lead banks were 37.1 percent of Missouri bank deposits and 39 percent of Tennessee bank deposits. These percentages accounted for 67.3 and 79.6 percent of the total deposits controlled by multiple bank holding companies in Missouri and Tennessee, respectively. Thus, while the proportion of state deposits controlled by holding companies has increased dramatically, that increase primarily represents formation of holding companies by larger banks, rather than an increase in the concentration of deposits in large banking organizations.

State Concentration – A preferable way of looking at the effect of holding company acquisitions on concentration is to consider the effect on state concentration ratios, the share of deposits in a state held by a specified number of the largest banking organizations. This differs from looking at the share of deposits controlled by all multiple bank holding companies, since the smaller holding companies are not considered and the number of organizations is held constant.

If it is assumed that deposits of subsidiary banks grew at the same rate after acquisition as they would have without acquisition, then the increase in concentration is simply the difference between the actual concentration ratio and a calculated ratio which assumes no banks were acquired after 1968. Thus, it is estimated that multiple bank holding companies increased the four-bank concentration ratio by 9.4 percentage points in Missouri and 4.4 percentage points in Tennessee (see Table II). The comparable figures for the ten-bank concentration ratios are 12.8 percentage points for Missouri and 10 percentage points for Tennessee.

SMSA Concentration – The same procedure can be used to estimate the effect of multiple bank holding companies on the four-bank concentration ratios in SMSAs. No Tennessee holding company owned more than one bank in any of the four largest SMSAs by the end of 1973. If it is true that affiliation with a holding company neither increases nor decreases a bank's growth, then in Tennessee multiple bank holding companies have not affected SMSA concentration. On the other hand, holding companies have acquired two or more banks each in some Missouri SMSAs. In St. Louis, the concentration in the four largest banking organizations is 3.7 percentage points higher than the 44.7 percent without such acquisitions; in Kansas City, concentration is 5.3 percentage points higher than the 52.4 percent; and in Springfield, it is 4 percentage points higher than the 82 percent without such acquisitions. Undoubtedly, a contributing cause to this difference between Missouri and Tennessee is the prohibition of branch banking in Missouri and permission of county-wide branching in Tennessee.

Table II

CONCENTRATION OF DEPOSITS IN LARGE BANKING ORGANIZATIONS

(December 31, 1973)

Percentage of Deposits Held by Four Largest Banking Organizations in the State

	Actual Concentration Ratio	No-acquisition Concentration Ratio[1]	Increase in Concentration[2]
Missouri	31.9%	22.5%	9.4%
Tennessee	36.5	32.1	4.4

Percentage of Deposits Held by Ten Largest Banking Organizations in the State

	Actual Concentration Ratio	No-acquisition Concentration Ratio[1]	Increase in Concentration[2]
Missouri	46.4%	33.6%	12.8%
Tennessee	62.7	52.7	10

[1]The no-acquisition concentration ratio gives the percentage of deposits held by the largest banking organizations, assuming no holding company acquisitions were made after December 31, 1968.

[2]The increase in concentration due to acquisition by holding companies between December 31, 1968 and December 31, 1973 is the difference between the actual and the no-acquisition concentration ratios.

INTERPRETING HIGHER CONCENTRATION

The foregoing discussion has shown that less restriction of branching and multiple bank holding companies is associated with higher concentration, but has given no basis for evaluating the significance of higher concentration. This is at the heart of the controversies about branch banking and multiple bank holding companies. An increase in a concentration ratio merely says that the percentage of deposits held by the largest banks has increased. It is the expected

effects of this increase on the performance of the banking organizations that are of interest, not the increase itself.

Increases in concentration of banking resources in states have a completely different interpretation than increases in SMSAs. Concentration in a state is an *aggregate concentration* measure; concentration in an SMSA is a measure of *market concentration*. The essential aspects of an aggregate concentration measure are that it is measured for a political entity, that it includes several markets, and that it emphasizes the relative sizes attained by some firms operating in several markets. Market concentration is measured, to the extent possible, for a geographic market – "the area within which the price of a commodity tends to uniformity, allowance being made for transportation costs."[6]

State Concentration

The effects some observers have attributed to an increase in banking concentration at the state level are on the prices charged and influence over the state government's legislative process.[7] It is argued that the effect on market prices occurs through the ability of large organizations operating in several markets to agree among themselves and to intimidate smaller firms. The effect of large organizations on the legislative process occurs because:

> Large companies start with certain initial political disadvantages because they are in the spotlight, because there is some suspicion of their power, and because small companies are more numerous. However, the large company can often overcome its handicap and obtain a decided advantage by political expenditures. The campaign contributions of large companies and the occasional case of direct or indirect bribery are probably the least significant sources of the large company's political power. More important, the large company spends whatever money is needed to argue effectively on behalf of its interest where a political issue affects it. . . . While some smaller business interests make a comparable showing through associations set up for the purpose, the experience of a Washington official is that small companies generally find out what is happening too late and prepare their cases too scantily and hastily to be fully effective where their interests conflict with those of large companies.[8]

Mutual Forbearance – The hypothesis that bank holding companies operating in several markets can agree on, and therefore affect, prices in those markets can be illustrated with a simple example. Suppose there are ten banking markets in a state and two banks in each market. Initially these banks are independently owned, but subsequently each of two holding companies in the state acquires one bank in each market. The hypothesis – sometimes called "mutual forbearance" – is that the two holding companies would be more likely to reach an agreement to raise prices in the ten markets than would the two banks in each market separately.[9] Thus, the prices paid for services by bank customers would be expected to rise on average.

But are there really forces leading to mutual forbearance? Would the two holding companies in this example be more likely to agree than the twenty individual banks?

The arguments supporting this hypothesis are that the benefits from such an agreement would be greater, and the costs of deviating from it – chiseling – would also be greater than if all the banks were individually owned. One agreement, instead of ten, could apply to all markets; therefore, the benefits would be greater from an agreement. If one of two banks in a market cheated on the agreement, that is, lowered prices for at least some customers, then the decrease in prices would occur in only one market. But if one of the two holding companies cheated in a market, then the "price war" could spread to all markets. Thus, the costs of deviating from an agreement would also be greater.

The mutual forbearance hypothesis is not, however, substantiated by any empirical tests for banking or other sectors of the U.S. economy. Furthermore, the arguments for it are less than completely convincing. The inherent desirability of one agreement is dubious. The primary defect of one overall agreement is the existence of different demand and cost conditions in different markets; under these conditions, ten separate

[6]George J. Stigler, *The Theory of Price* (New York: The MacMillan Company, 1966), p. 85.

[7]These are the effects briefly mentioned by Samuel H. Talley, "The Impact of Holding Company Acquisitions on Aggregate Concentration in Banking," *Staff Economic Studies*, no. 80, Board of Governors of the Federal Reserve System, pp. 1-2. The problem is analytically the same as that discussed by Corwin D. Edwards, "Conglomerate Bigness as a Source of Power," *Business Concentration and Price Policy* (Princeton: Princeton University Press, 1955), pp. 331-52, and in an accompanying "Comment" by George W. Stocking, pp. 352-59.

[8]Edwards, "Conglomerate Bigness," pp. 346-47.

[9]An increase in state concentration of deposits does not, however, necessarily reflect an increase in the probability of mutual forbearance. Such an increase may result from deposit growth in only one bank or acquisitions in markets where no other state-wide banking organizations operate. In these cases, banking organizations would not be facing each other in more markets than before.

agreements could be superior from the holding companies' point of view. Also, it has in no way been established that an appropriate response to chiseling in one market would be a price war in all ten markets. This would only ensure that the decreased "profits" in one market would spread to ten markets.

Predatory Pricing — The ability of large organizations operating in several markets to discipline smaller ones operating in one market is the other alleged way that large organizations could increase prices paid by customers. In other words, if a small firm should be so bold as to chisel, it is argued that the larger organization would respond by cutting its prices in order to decrease the "profits" of the small chiseler.[10] This practice has often been called "predatory pricing" or "cutthroat competition." It may be designed either "to teach the chiseler a lesson," to drive him into a merger, or to force him out of business. The large firm would have no differential advantages when it cuts prices unless it incurs costs greater than its revenue. Both the larger and the smaller firms would simply make less "profit" than they would otherwise. The large firm could only have a differential advantage when it is incurring losses.

The advantage attributed to large firms when they cut prices below their cost and their competitors' costs is superior access to capital — a lower price paid for capital. They could finance the losses at a lower cost than smaller firms; therefore, they would have a differential advantage in a price war. This lower cost of capital to large firms purportedly exists because the price war could be financed by funds generated in other markets where the larger firms are receiving "monopoly profits." But the large firm would not really have a lower cost of capital. The cost of anything is the highest-valued alternative foregone. And as long as one of its alternatives would be to loan to a small firm (with a cost of capital the same as the small firm it is trying to intimidate), then this alternative would be superior to financing a price war.

An additional argument against the likelihood of predatory pricing is summarized by George J. Stigler in a fictional discussion in which a potential victim of predatory pricing by John D. Rockefeller tells a lender:

> "There is a threat of a three-month price war, during which I will lose $10,000, which unfortunately I do not possess. If you lend me the $10,000, I can survive the price war — and once I show your certified check to Rockefeller the price war will probably never be embarked upon. Even if the price war should occur, we will earn more by co-operation afterward than the $10,000 loss, or Rockefeller would never embark upon the strategy."[11]

And indeed, Rockefeller did buy out his rivals rather than try to drive them out of business by such tactics.

It is noteworthy that one cannot conceive that bank regulators would allow a price war. As a matter of fact, much of bank regulation is designed to suppress price competition, replacing it with other forms of competition. As Ray M. Gidney, a recent Comptroller of the Currency, said:

> I think the important thing we should hope for is a degree of enlightenment on the part of people that run these banks so that they go out and give service. That is where we want competition, competition in giving service.[12]

Concentration of Political Power — For large firms to have a disproportionate effect on legislation, it would be necessary for them to have a differential advantage in contributing to political campaigns, delivering votes, or providing information to legislators. These are the three means by which politicians' votes in legislatures can be influenced.[13]

At least in banking, there is no presumption whatsoever that large organizations have any differential superiority in any of these activities. Campaign contributions by corporations are illegal, and therefore will not generally be made. The wealth position of small banks' stockholders generally would be more substantially affected by banking legislation than the wealth position of stockholders of large banking organizations. Therefore, the small number of stockholders of numerous small banks are more likely to make contributions and vote on the basis of legislators' votes on banking legislation than are the numerous stockholders of a few holding companies. It is also unlikely that large holding companies have any superiority over small banks in supplying information to

[10] This decrease need not involve a price cut below marginal cost, as has been argued by B. S. Yamey, "Predatory Price Cutting: Notes and Comments," *Journal of Law and Economics* (April 1972), pp. 129-42. He also provides a summary and evaluation of the literature generated by the classic paper on this subject, John S. McGee, "Predatory Price Cutting: The Standard Oil (N. J.) Case," *Journal of Law and Economics* (October 1958), pp. 137-69.

[11] George J. Stigler, *The Organization of Industry* (Homewood: Richard D. Irwin, Inc., 1968), p. 116.

[12] U. S. Congress, Senate, *Regulation of Bank Mergers*, 86th Cong., 1st sess., 1959, Committee on Banking and Currency, p. 31. For an economic analysis of why producers prefer to substitute nonprice competition for price competition, see Stigler, *The Organization of Industry*, pp. 23-28.

[13] See Albert Breton, *The Economic Theory of Representative Government* (Chicago: Aldine Publishing Co., 1974), pp. 74-98.

legislators. Bankers, through state and independent bankers associations, are well organized, whether they are large or small.

Thus, just as increased state concentration does not necessarily have any effects through mutual forbearance or predatory pricing, there is no substantial effect of increased state concentration on the legislative process.

Market Concentration

There are two hypotheses related to increased market concentration. One hypothesis is that increased concentration is associated with lower prices charged to customers due to the efficiency of large-scale operations. According to the second hypothesis, increased concentration facilitates agreement – explicit or tacit collusion – about prices in the market and is thus associated with higher prices charged to customers.[14] Those who are in favor of relatively few restrictions on branching and acquisitions by multiple bank holding companies assert the first hypothesis when presenting their views. Those who are opposed to branching and holding company acquisitions of banks refer to the second hypothesis when interpreting the higher concentration which results from branching and multiple bank holding companies.

Efficiency — The hypothesis relating efficiency and concentration is an attempt to answer an important question: How does higher concentration develop? Higher concentration is synonomous with higher market shares of the larger firms. The arguments advanced in the discussion of state concentration imply that high market concentration does not result from predatory pricing by larger firms.

A firm's larger share of a market means that a larger percentage of the business in the market is going to that firm. This larger share of the business must result because customers prefer that firm to others, perhaps because of a lower price or a higher-quality product. Thus, it can be argued that concentration is higher because some firms are relatively more efficient.

This argument is weaker for banking than for other industries because of entry and branching regulations. Implicit in the argument is the assumption that the most efficient firms in servicing customers are those that are presently operating and that expansion is largely determined by relative efficiency. But entry regulation is designed precisely to protect existing banks from the competition of new banks; this is also a consideration in branching applications. Also, banking regulators determine to some extent who receives charters and which banks grow through branching. The interests of regulators and bank customers are not necessarily coincident.

Existing empirical evidence does not falsify the hypothesis that increased concentration results from the relative efficiency of larger banks.[15]

Collusion — The increased concentration, according to the second hypothesis, facilitates collusion among banks. Just as a single firm operating in a market maximizes the wealth of all the owners of the firm, an agreement between firms operating in a market can maximize the wealth of all the owners of the firms. There is, of course, a problem of distributing the gains from the agreement, a problem which does not arise for a monopoly.

Each of the firms in a market can increase the wealth of its owners if it cheats on the agreement while all other firms adhere to it. The chiseling can take various forms. It may be secret price cutting, changes in credit terms, or changes in the quality of the product in some other way. Whether the firm is cutting its pecuniary prices or making the nonpecuniary terms of its sales more attractive to buyers, it will desire to keep its actions secret. If the other firms

[14]The use of the term "collusion" in this paper is not to be confused with the legal definition. Collusion as used in this paper includes legal collusion and a great deal more — any explicit or implicit agreement — not just explicit agreements. Those setting the prices need not even intend to agree; they need only act *as if* they agree.

[15]Much of the literature on the relationship between bank's sizes and efficiency — so-called "economies of scale" — is reviewed and analyzed in Jack M. Guttentag and Edward S. Herman, "Banking Structure and Performance," *The Bulletin* of New York University Graduate School of Business Administration (February 1967), pp. 105-25, 169-96. Two recent studies are: Frederick W. Bell and Neil B. Murphy, "Costs in Commercial Banking," Federal Reserve Bank of Boston Research Report No. 41; and Lionel Kalish III and R. Alton Gilbert, "An Analysis of Efficiency of Scale and Organizational Form in Commercial Banking," *Journal of Industrial Economics* (July 1973), pp. 293-307. The empirical evidence *generally* indicates that banks of less than about $10 million deposit size are relatively high-cost banks and that other banks probably have about the same average cost.

There are, however, unresolved conceptual and measurement problems, which apply to all studies of economies of scale in banking, that imply the empirical evidence must be interpreted carefully. Two of these problems are the inability to account adequately for changes in the types of deposits received and loans made as sizes of banks expand and the individual nature of banks' cost functions. For elaboration and analysis of the latter problem, see Milton Friedman's "Comment," pp. 230-38, on Caleb A. Smith, "Survey of the Empirical Evidence on Economies of Scale," pp. 213-30, in *Business Concentration and Price Policy*, and Harold Demsetz, "Industry Structure, Market Rivalry, and Public Policy," *Journal of Law and Economics* (April 1973), pp. 1-9. Interpreted in the light of Friedman's and Demsetz's analyses, the empirical evidence is consistent with larger banks being larger because they are more efficient.

find out, they will take account of the price cutter's actions and set a lower price or improve the nonpecuniary terms of their sales.

This antagonism between the interests of the firms with an agreement is the basis of the relationship between market concentration and the prices charged customers in markets. The smaller the number of firms in an agreement and the larger their relative market shares, the easier effective collusion is likely to be.[16]

Another enemy of collusion, second to existing firms' mutual antagonism, is entry of new firms into the market. Those not presently in the market are not part of the agreement and, seeing the returns being received by firms in the market, are likely to be induced to enter. If they are subsequently made part of the agreement, the returns to those originally colluding are diluted. If they are not made part of the agreement, then the effect on the collusive prices is the same as that of a discovered chiseler – a lower price.

Entry and the possibility of it can attenuate the relationship between concentration and prices. But regulation of entry in banking effectively protects many markets from entry and in all cases reduces the probability of entry.

If increased collusion follows from increased concentration, one would expect to observe higher loan rates and higher rates of return for banks. The existing empirical evidence does not falsify this hypothesis either.[17]

CONCLUSION

The controversies over branching and multiple bank holding company expansion are concerned with the effect of these multi-office organizations on concentration. In larger SMSAs, the Eighth District states with limited branch banking tend to have higher concentration of deposits in the four largest banking organizations than the unit banking states. State concentration has increased as a result of the rapid expansion of multiple bank holding companies in Missouri and Tennessee, but the effect on SMSA concentration has been somewhat less.

These findings are of little interest until the implications of increased concentration are assessed. It has been shown that there are no convincing arguments and no empirical evidence that state concentration has any significance. On the other hand, evidence has been advanced which supports both the hypothesis that increased market concentration results from the efficiency of large organizations and the hypothesis that increased concentration facilitates collusion among the organizations. The relationship between efficiency and concentration, by itself, implies that banks' customers gain as a result of higher concentration; but the relationship between collusion and concentration, by itself, implies that banks' customers lose as a result of higher concentration. Less restrictions on branching and multiple bank holding companies is associated with higher concentration. Therefore, there are both potential benefits and costs for banks' customers from such lessened restrictions.

Since it is so often thought to be implied, it is necessary to point out that this amalgam of collusion and efficiency does not imply that omniscient regulators could weigh the costs and benefits of higher concentration and determine a more "optimal" banking structure than that which would develop by permitting free market forces to operate. Such a weighing process is impossible. The evidence regarding both costs and benefits is imprecise and hobbled by the use of available accounting data to measure economic concepts. It is unlikely that the factors that result in imprecision will soon be overcome and even more unlikely that present accounting data can be replaced by more relevant data.

[16] Thomas R. Saving, "Concentration Ratios and the Degree of Monopoly," *International Economic Review* (February 1970), pp. 139-46, briefly presents the theory behind the concentration ratio as a concentration measure. George J. Stigler "A Theory of Oligopoly," *Journal of Political Economy* (February 1964), pp. 44-61, analyzes the mutual antagonism and relates enforcement costs to the Herfindahl index of concentration. Concentration ratios and Herfindahl indexes are highly correlated.

[17] Guttentag and Herman, "Banking Structure and Performance," pp. 80-104, also review the evidence accumulated before 1967 on the relationship between concentration, prices, and "profits." Additional evidence is provided by Donald P. Jacobs, *Business Loan Costs and Bank Market Structure: An Empirical Estimate of Their Relations*, Occasional Paper 15, National Bureau of Economic Research, and Arnold Heggestad, "Market Structure, Risk, and Profitability in the Banking Industry," in Proceedings of a conference on *Bank Structure and Competition*, Federal Reserve Bank of Chicago, 1972. Taken as a whole, the empirical evidence is consistent with a statement that higher concentration results in higher rates on loans and higher rates of return for banks.

APPENDIX: SELECTED BANK REGULATIONS IN EIGHTH DISTRICT STATES

Regulation of banking can directly affect banking structure through limitations on entry, mergers, branching, and acquisitions of banks by multiple bank holding companies. All of these activities are subject to regulation at both the Federal and state levels.[1]

Entry

Before a bank may begin operations, Federal or state banking officials must grant a charter to the bank's organizers. The division of authority for examining charter applications, as well as applications for other actions discussed in this Appendix, is shown in Table A-I.

One purpose of entry regulation is to prevent a new bank from opening where it might fail or its opening might cause an existing bank to fail. Therefore, the Federal banking officials consider the future earnings prospects of the bank and the effect of entry on the "soundness" and earnings prospects of existing banks. They also consider the effect of the new bank on the "convenience and needs of the community to be served" — that is, the extent to which the new bank might provide more services or services at lower cost than are currently available. The state laws, which are similar to the Federal laws, are outlined in Table A-II.

The concern of bank chartering agencies that existing banks not be hurt by new entry and that new banks meet a "needs" criterion has resulted in fewer banks being chartered than would have been in the absence of such regulation.[2] One effect of this relative difficulty of entry has been to limit the development of competition in banking.

Table A-I

Division of Authority Among Bank Regulatory Agencies

Agency	Chartering*	Branching	Mergers
Comptroller of the Currency	National banks	National banks	Resulting bank a national bank
Federal Reserve Board	State member banks	State member banks	Resulting bank a state member bank
Federal Deposit Insurance Corporation	Nonmember insured state bank	Nonmember insured state bank	Resulting bank a nonmember insured bank
State Banking Agencies	All state banks	All state banks	Resulting bank a state bank

*Charters for national banks are issued by the Comptroller of the Currency, and state bank charters are issued by state banking agencies. The Federal Reserve Board reviews charter applications when acting on applications of state banks for membership in the Federal Reserve System. The FDIC reviews charter applications when acting on applications of state nonmember banks for deposit insurance.

[1]For a more detailed discussion of Federal regulation, see Gerald C. Fischer, *American Banking Structure* (New York: Columbia University Press, 1968). Tables at the end of this Appendix provide some of the details of state laws on entry, mergers, branching, and multiple bank holding companies.

[2]For a discussion of entry into banking, see Sam Peltzman, "Entry in Commercial Banking," *Journal of Law and Economics* (October 1965), pp. 11-50.

Table A-II

State Banking Laws on Entry

	1. Persons Applying	2. Capital Requirements	3. Bank's Prospects	4. Convenience & Needs	5. Adverse Effect on Other Banks
Arkansas	5 or more qualified natural persons, majority Arkansas residents, with confidence of community.	Requisite capital subscribed in good faith, the minimum depending on community size.	—	There exists a public necessity of the business of the community.	—
Illinois	5 or more incorporators, residents of Illinois, with general character such that "reasonable promise of successful operation exists."	Meets minimum capital requirements, the minimum depending on community size.	Future earnings favorable.	Convenience and needs of area sought to be served will be promoted.	—
Indiana	10 or more natural persons of lawful age, majority Indiana residents.	Meets minimum capital requirements, the minimum depending on community size.	Approval of Department of Financial Institutions "in its discretion".	Approval by Department of Financial Institutions "in its discretion".	Approval by Department of Financial Institutions "in its discretion".
Kentucky	5 or more persons for bank; 7 or more for trust; 7 or more for bank & trust; 13 or more for bank, trust, and real estate title.	Meets minimum capital requirements, the minimum depending on city size.	Reasonable assurance of sufficient volume of business for success.	Public convenience and advantage will be promoted.	—
Mississippi	5 or more persons of full age and of good moral and business character.	Capital stock and surplus required, the minimum depending on community size.	Reasonable prospects of growth of the area and its financial resources, expectations of profitable operations.	Determine whether the public necessity requires that the proposed new bank should be chartered and allowed to operate.	Record of earnings and condition of existing unit banks (not branch banks) and effect on them.
Missouri	5 or more persons with character, responsibility, and general fitness of person such as to command confidence.	Requisite capital subscribed in good faith and paid in cash, the minimum depending on community size.	Probable volume of business in locality sufficient to insure and maintain solvency of the new bank.	Convenience and need of community justify and warrant opening of new bank.	Probable volume of business in locality sufficient to maintain solvency of new bank and existing banks, without endangering safety of any bank.
Tennessee	5 or more incorporators, majority residents of Tennessee; proposed officers and directors have sufficient experience, ability, and standing to assure reasonable promise of successful operation.	Adequate capital and surplus, the minimum depending on community size.	Conditions in community afford reasonable promise of successful operation.	Public need and advantages promoted.	Need in community for new bank, considering adequacy of existing banks.

Table A-III

State Banking Laws on Mergers

Arkansas	Illinois	Indiana	Kentucky	Mississippi	Missouri	Tennessee
Mergers allowed with sufficient disclosure.	Resulting bank meets requirements for forming new bank and agreement fair to all concerned.	Agreement of shareholders and boards of the merging banks; prior approval by Department of Financial Institutions "in its discretion."	Documents submitted to stockholders; institutions located in same city or county.	Majority of board of directors; terms of conditions lawfully agreed upon.	Consent of holders of two-thirds of capital stock generally; disclosure of agreements.	Same county; meets requirements for forming new bank; agreement fair; not contrary to public interest.

Mergers

Prior approval by a Federal banking agency is required for all mergers resulting in an insured bank. If the resulting bank is to be a state bank, approval of state banking officials is also necessary. The provisions of state laws on mergers in Eighth District states are outlined in Table A-III.

In deciding whether to approve or deny a merger application, Federal banking officials are required by the Bank Merger Act to consider the effects of the merger on competition, the future prospects of existing and proposed institutions, and the convenience and needs of the community to be served. No merger which would result in a monopoly or would tend to create a monopoly can be approved. If a merger would result in a "substantial lessening of competition,"[3] it can be approved only if the probable effects of the merger in meeting the convenience and needs of the community to be served clearly outweigh the anticompetitive effect.

Branching

All banks in a state, whether national or state-chartered, are subject to state laws concerning the locations of branches, the number of branches allowed, the services that may be offered, and the capital required for opening a branch.

There are both unit banking and limited branch banking states in the Eighth District. The least restrictive state law (Mississippi) permits branch banking within 100 miles of a bank's home office. The provisions of the present state laws are contained in Table A-IV, p. 22.

[3]This term is not defined in legislation but refers to a less extreme reduction in competition than would result from creation of a monopoly.

Multiple Bank Holding Companies

Federal — Prior to 1956, the bank acquisitions of multiple bank holding companies were virtually free of Federal regulation. The Bank Holding Company Act of 1956 brought this activity under Federal control by requiring prior approval by the Federal Reserve Board of any action resulting in ownership of 5 percent or more of a bank's stock by a company owning two or more banks. In determining whether or not to approve an acquisition, the Board was required to consider banking and competitive factors, but the competitive factors were given less emphasis than the so-called banking factors. In addition, acquisition of a bank outside a holding company's home state was prohibited, unless the acquired bank's state law specifically allowed such acquisitions.

Amendments to the Bank Holding Company Act which were passed in 1966 and 1970 shifted the emphasis from banking factors to competitive factors and brought one-bank holding companies under the Board's supervision. The 1966 amendments provided that the Board apply the same tests in considering acquisitions by bank holding companies that Federal officials apply in bank merger cases. The 1970 Amendments brought companies owning one bank under the purview of the Board.

State — Formation of multiple bank holding companies is prohibited in the majority of the Eighth District states. This has been the case for some time in Illinois, Indiana, Kentucky, and Mississippi.

In 1971, an Arkansas law was passed which prohibits companies from becoming multiple bank holding companies or existing holding companies from making any further acquisitions; prior to that time, there had been no restrictions on such companies in Arkansas. Until this year Missouri and Tennessee had no restrictions on multiple bank holding companies; both states now have laws which limit the size of holding companies. The Tennessee Bank Structure Act of 1974 places additional restrictions on holding company acquisitions. Details of state laws are provided in Table A-V, p. 23.

Table A-IV

State Banking Laws on Detached Offices

	Which Banks	Number of Detached Offices	Location	Powers
Arkansas	Any bank.	No limit on number of full-service branches.	Within corporate limits of home-office city or town if greater than 300 feet from any other bank; in any city or town in home-office county with population at least 250 and no home office of another existing bank; in any planned community development in home-office county with population at least 250; nothing allows branches outside home-office county.	All lawful banking activities as fully as in the main office.
Illinois	Any bank.	One Facility.	Not more than 1500 feet from home office and generally more than 600 feet from other banks' premises.	Receive deposits, cash and issue checks, drafts and money orders, change money and receive payments on existing debts.
Indiana	(a) Any bank.	(a) One branch for every $200,000 of capital and surplus.	(a) Anywhere in county.	(a) (Powers of bank.)
	(b) Banks in counties with population less than 500,000 or having 3 or more second-class cities.	(b) No limit.	(b) Any city or town in home-office county if no bank located in the city or town.	(b) Same as (a).
	(c) Banks in counties with population greater than 500,000 and less than 3 second-class cities.	(c) No limit.	(c) Any city or town in county.	(c) Same as (a).
Kentucky	(a) Any bank with capital and surplus not less than $100,000 with principal office in an area with population less than 8,000.	(a) One branch for each $100,000 of capital and surplus.	(a) County-wide branching except if home office of another bank in town or city (but not branching bank's home-office town) or if home office of another bank in unincorporated area within one mile.	(a) Same powers as principal office.
	(b) Any bank with capital and surplus not less than $200,000 with principal office in a city with population of 8,000 or more and less than 20,000.	(b) One branch for each $200,000 of capital and surplus.	(b) Same as (a)	(b) Same as (a).
	(c) Any bank in city with population of 20,000 or more.	(c) One branch for each $250,000 of capital and surplus.	(c) Same as (a)	(c) Same as (a).
Mississippi	(a) Any bank.	(a) Branch offices — no limit.	(a) Within home-office city if population at least 10,000 and within home office county and adjacent counties, but not in any city or town with population less than 3500 and one or more existing banks or branch banks.	(a) (Powers of bank.)
	(b) Same as (a).	(b) Branch banks — maximum of 15; capital requirements of $100,000 plus minimum capital required for unit bank at location.	(b) Within radius of 100 miles from home office, but not in any city or town with population less than 3100 and one or more existing banks.	(b) Same as (a).
Missouri	(a) Any bank.	(a) Two facilities.	(a) Within limits of city, town, or village or unincorporated area in which home office is located and home-office county (but not within 400 feet of another bank generally).	(a) Checks paid, deposits received, deposits withdrawn, change made, exchange made, bank money orders issued, safe deposit boxes maintained and rented and loan payments received.
	(b) Banks in third-class counties with population of 35,000 or less.	(b) One facility.	(b) In a town with population of 1550 or less, which does not have banking services and is not more than 10 miles from the bank's main office.	(b) Same as (a)[1].
Tennessee	Any bank.	No statutory limit on the number of branches.	Within home-office county.	(Powers of bank.)

[1]Loans may now be made at these facilities, pursuant to Missouri Commissioner of Finance Ruling No. 15 of June 27, 1974.

Table A-V

State Banking Laws on Multiple Bank Holding Companies (MBHCs)

	ARKANSAS	ILLINOIS	INDIANA	KENTUCKY	MISSISSIPPI	MISSOURI	TENNESSEE
1. Definition	Company owning or controlling 25% or more of shares of more than one bank.	Company owning or controlling 15% or more of shares of more than one bank, controlling election of majority of directors of more than one bank, holding 15% or more of voting shares of more than one bank in trust for shareholders' benefit.	Company with 25% ownership.	—	Any corporation with any object, purpose or power of directly or indirectly organizing, owning, or operating banks in groups or chains.	—	Incorporates definition from Federal Bank Holding Company Act of 1956, as amended.
2. Restrictions on							
(a) Becoming an MBHC	Unlawful	Unlawful	Unlawful	No person (individual or company) may own or control more than one-half of the capital stock in two or more banks.	Unlawful	—	—
(b) Acquisitions	Unlawful for an MBHC to acquire assets of a bank.	Unlawful for any MBHC to take actions resulting in owning or controlling greater than 5% of voting shares of any bank.	Unlawful for MBHC to acquire greater than 5% control of any bank; also unlawful for subsidiary to acquire assets of any bank.	No person controlling more than one-half of the capital stock in one bank may acquire any stock in another bank.	(Implicitly unlawful.)	Holding companies whose bank subsidiaries have 13 percent or more of total commercial bank deposits in the state (after the banks deduct foreign deposits, certificates of deposit of more than $100,000, and out-of-state correspondent deposits from their deposits) may not acquire additional banks.	No restrictions on acquiring banks which have operated for five years or more, except that holding companies whose subsidiaries have 16.5 percent or more of individual, personal, and corporate demand and savings deposits may not acquire any additional banks.
(c) De novo banks	Unlawful	(Implicitly unlawful.)	(Implicitly unlawful.)	—	(Implicitly unlawful.)	—	Prohibited until 1980, except in the four largest counties.
(d) BHC mergers	Unlawful	(Implicitly unlawful.)	Unlawful	—	(Implicitly unlawful.)	—	—
(e) Other	Only closely related activities.	—	—	—	—	—	—