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REVIEW



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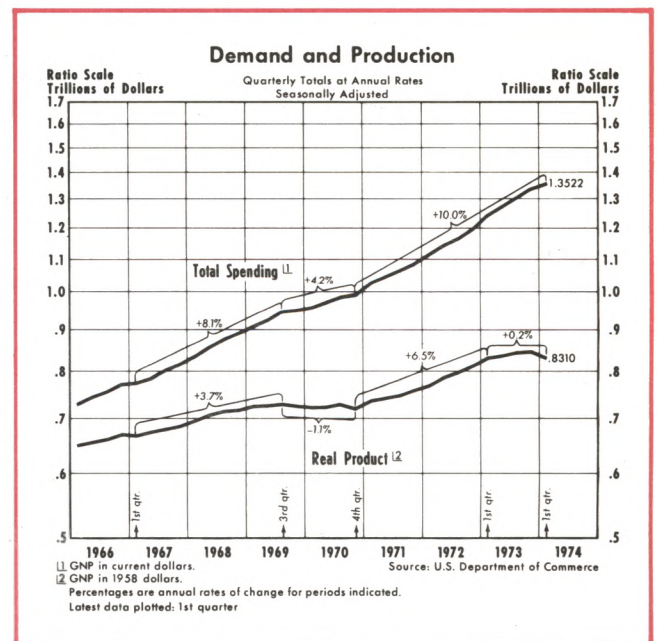
A Monetary Prescription for an Ailing Economy

An Address by DARRYL R. FRANCIS, President, Federal Reserve
 Bank of St. Louis To Steel Plate Fabricators Association
 Key Biscayne, Florida, April 29, 1974

IT IS good to have this opportunity to present my views regarding inflation and the economic outlook. I find it rather sobering to reflect that our country, as well as most other major industrial countries, has experienced almost a decade of rising inflation. In reviewing economic history, I find that we are at a point similar to 1939 in that then too our country, along with the rest of the world, was ending a decade of economic difficulty — a recession. The disquieting similarity is that in both instances some prominent individuals could see no end to the situation in sight and counseled us to learn to live with it.

I rejected the idea then and I reject it now. I continue to believe that we have the knowledge to bring this devastating inflation under control. Economic stabilization actions formulated and acted upon now will be the most important influence on our economy, not only during late 1974, but over the balance of the 1970s. Our present concern is for simultaneously reducing inflation and permitting growth of output to return to a rate consistent with optimal utilization of our nation's productive potential.

Recently, two sharply divergent views have been advanced regarding the proper course of economic stabilization policy at this time. One view is that expansionary actions must be taken immediately to guide the economy to so-called "full employment". The other view is that restrictive actions must be taken to reduce the rate of inflation.



The recognized importance of stabilization actions for the future, and the conflicting recommendations surfacing around us, dictate that we examine the experience of stabilization actions over the last decade to seek out some lessons which can be helpful in selecting an appropriate course of action now and for the future. The last decade was one of accelerating inflation and, at times, deviations of output growth from our nation's productive potential.

In developing some of the lessons from past stabilization efforts, it is helpful to make a brief survey of the premises which had a dominant influence on policy actions taken over much of the past decade. Once these have been outlined, the experience of the past decade will be reviewed to evaluate the usefulness of these premises as a basis for undertaking future stabilization actions. Finally, against the background of these lessons, the implications for inflation and the economic outlook of the two policy alternatives will be discussed.

PREMISES OF STABILIZATION POLICY OVER THE PAST DECADE

Let us now review the premises which guided stabilization efforts during the past decade. A foremost premise was that positive government actions were required to produce proper growth of output of goods and services so as to assure "full employment" of our labor and industrial resources. In other words, many observers contended that without active government guidance our economy would tend to produce an unacceptable level of employment and growth of output.

There were two premises regarding the causes of inflation. One premise was that inflation, for the most part, did not normally occur unless aggregate demand for goods and services was "pushed" to a level close to or greater than our economy's ability to produce. But this need not happen, it was argued, because government actions could be used to assure that the level of aggregate demand would never be in excess of capacity output.

The other premise was that special factors could, at times, cause inflation. Some important factors cited were the use of industrial monopoly power, the exercise of labor market power by strong unions, special conditions in major domestic markets, and rising prices of internationally traded commodities.

In summary, it was believed that so-called "full employment" of our resources would not naturally occur; therefore, government should take actions for promoting growth of aggregate demand so that output would be at our economy's productive potential. Given skillful application of aggregate demand management, inflation need not occur, except for that attributed to special factors which were believed to be beyond the control of traditional stabilization tools.

Four major propositions guided the implementation of economic stabilization policy over most of the last decade. First, the dominant view was that fiscal actions, that is, changes in government spending and

taxing programs, were the most effective means for guiding the course of output along a non-inflationary, "full employment" path. Second, monetary actions were viewed as being of minor importance. Federal Reserve actions were assigned an accommodative role in the sense that they should be directed toward promoting a level of market interest rates consistent with the over-all intent of stabilization policy. A third proposition was that management of aggregate demand should be conducted on a short-run basis of a few quarters. The fourth proposition was that selective incomes and price policies were necessary to control inflation arising in monopoly industries and in industries dominated by powerful labor unions.

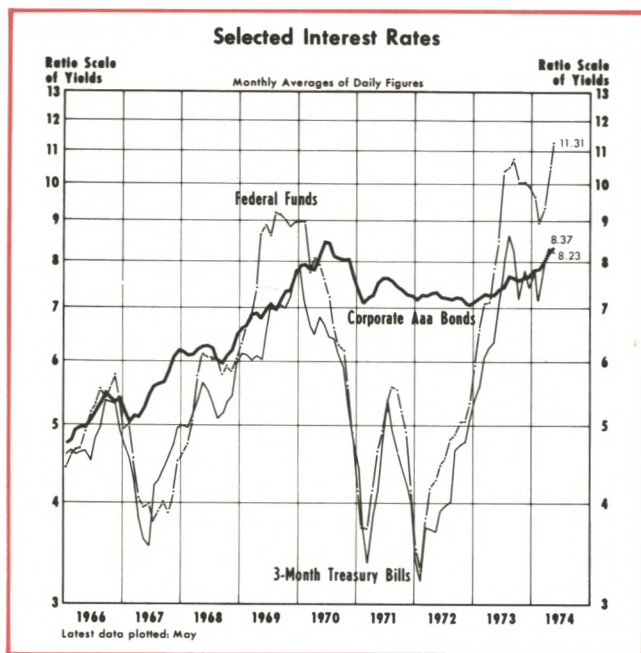
STABILIZATION ACTIONS TAKEN

An examination of the record indicates that stabilization authorities were very busy over the past decade. The policy tool that received the most attention during that time was fiscal actions. I will cite just a few examples of its use. There was the Revenue Act of 1964 which included across-the-board rate reductions in personal and corporate income taxes; the Revenue and Expenditure Control Act of 1968 which imposed a temporary ten percent surcharge on personal and corporate income taxes; and the on-again, off-again, investment tax credit. At times, such as in 1969, 1971, and 1973, attempts were made to hold down increases in government spending.

The Federal Reserve was also very active in economic stabilization during the past ten years. For example, from 1964 to 1973, the Federal Open Market Committee, commonly referred to as the FOMC, met 141 times, and at seventy percent of these meetings a policy of restraint was adopted. Only in 1967 and 1970 did the FOMC adopt a policy of ease at virtually every meeting.

Throughout most of the past decade FOMC actions were directed mainly toward promoting an appropriate level of market interest rates. For the most part, these actions can be said to have been accommodative, in the sense that although interest rates were permitted to rise, the FOMC attempted to restrict interest rates to levels believed to be not so high as to interfere with the achievement of full employment. Even though more emphasis was given to movements in monetary aggregates late in the decade, open market transactions continued to be subject to an interest rate constraint.

Finally, when inflation threatened to reaccelerate in 1971, a time of excess capacity, it was believed by



many that the inflationary situation was due to special factors; as a result, price and wage controls were adopted. Since then, these controls have gone through two complete cycles—from freeze to guidelines to thaw, then back to freeze, guidelines, and phase-out. For the most part, these controls were administered on a selective basis.

UNDESIRE RESULTS CAN SERVE AS LEARNING EXPERIENCE

What have been the end results of these activist economic stabilization actions taken over the past decade? Our economy has experienced a high, and accelerating rate of inflation, which still persists. There was a shallow recession in 1970, followed by a period of slow recovery. Market interest rates rose to their highest levels in fifty years. At times severe dislocations occurred in commodity, labor, and financial markets. At the present time our economy is undergoing what some have labeled “stagflation”.

From these events it is quite apparent that, in spite of good intentions and much effort, economic stabilization actions have not produced desired results. So let us now examine this experience for some lessons which may be helpful in planning future stabilization efforts.

Accelerating inflation started when our economy began to operate at capacity levels in the mid-1960s, tending to confirm the view that mismanagement of aggregate demand could cause inflation. But then in 1970 and 1971, when output fell and continued to re-

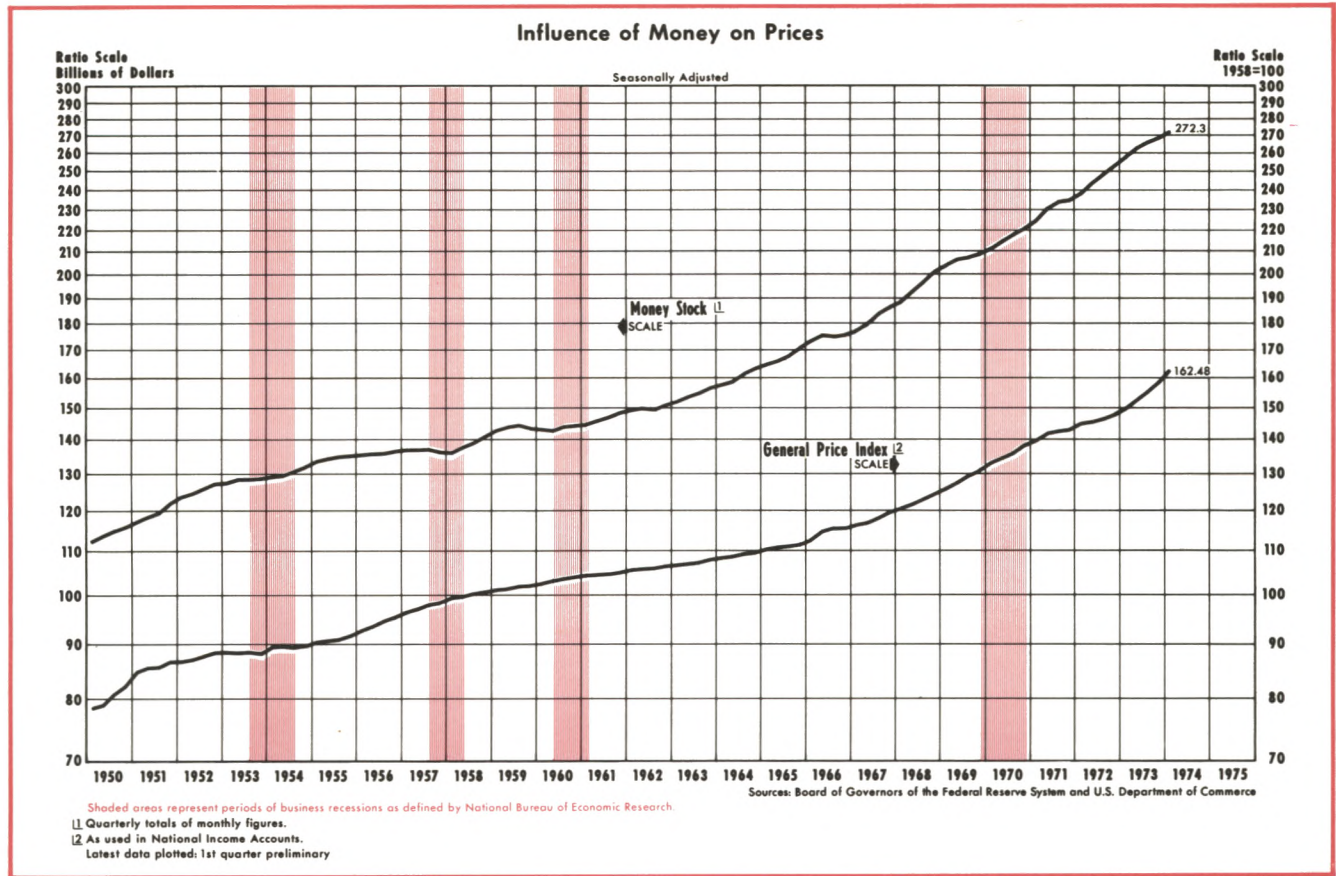
main considerably below capacity, inflation remained high, contrary to the view that inflation would quickly subside when aggregate demand was less than capacity output. So, the cause of inflation was *then* attributed to monopoly and labor union power. But the record of the decade indicates that there was little, if any, increase in industrial concentration and that membership in labor unions as a percent of the labor force actually declined.

Thus, it appears that it was a fallacy to base monetary and fiscal actions on the proposition that they need to be concerned about inflation only when aggregate demand is pushed in the neighborhood of our economy's productive potential. A second fallacy, suggested by this experience, was that the rate of inflation would quickly subside if aggregate demand is held below productive potential for only a few quarters. A third fallacy was that industrial monopolies and labor unions are an important cause of inflation.

Another lesson from the past decade's experience is that an activist policy cannot easily guide aggregate demand in such a manner as to promote a relatively low unemployment rate with little inflation. Since 1961, the beginning of activism in economic stabilization, the unemployment rate has averaged 4.9 percent. This is the same as in the Eisenhower years, a period which most activists would contend was not particularly noted for efforts to promote a substantially lower unemployment rate. The major difference between these two episodes is the rate of inflation. The overall price index rose at a 2 percent average annual rate from 1952 to 1960, and continued to rise slowly until the mid-1960s. But then the rate of price increase accelerated, and has been at about a 5 percent rate since 1968.

Another lesson is that price and wage controls are not an effective method of curbing inflation when aggregate demand is near capacity output, contrary to the dominant view of the past decade. The implementation of such controls in 1971 quickly led to many disruptions in the functioning of markets and reported inflation remained high, except in the freeze periods. After almost three years they have been abandoned.

Experience over the past ten years casts strong doubts regarding the effectiveness of fiscal actions in guiding the economy along a desired path. Adoption of the income surtax of 1968, and the imposition of curbs on government spending since 1968, were taken for the purpose of slowing growth of aggregate demand. With the exception of 1970, a recession year,



growth of aggregate demand accelerated each year. For the period 1968 to 1973, current dollar GNP rose at an average 8 percent annual rate, compared with a 7 percent rate from 1960 to 1968, and a 5 percent rate from 1952 to 1960.

A final set of lessons, and I believe the most important ones, are in regard to prevailing views of monetary actions. One view was that monetary actions were important in only an accommodative sense of keeping interest rates from rising too high or too rapidly. Another view was that the influence of monetary actions was best measured by movements in market interest rates, not by changes in growth of the money stock.

The validity of these propositions has been questioned as a result of the experience of the past decade. An extensive body of research has emerged regarding the influence of monetary actions, measured by changes in the money stock, on economic activity. Rather than cite specific research studies, I will summarize some conclusions of these studies.

First, there is considerable evidence consistent with the proposition that inflation is primarily a monetary

phenomenon. This proposition holds that an increase in the trend growth of money is followed by an increase in the rate of inflation. This proposition thus attributes the basic cause of our present inflation to the accelerating trend growth of money since the early 1960s. The money stock rose at about a 2 percent average annual rate from 1952 to 1962, accelerated to a 4 percent rate in the period ending 1966, accelerated further to a 6 percent rate in the period ending 1971, and has been at about a 7 percent rate since then. Accelerations in the rate of inflation have followed accelerations in the trend growth of money.

Second, these studies present evidence consistent with the proposition that short-run accelerations and decelerations in the rate of money growth are followed, with a short lag, by similar movements in growth of real output. It is thus concluded that monetary actions, measured by changes in the money stock, are an important cause of economic fluctuations.

A third lesson is that market interest rates are a poor indicator of the tightness or ease of monetary actions, and that the use of market interest rates in conducting monetary policy can ultimately lead to accelerating inflation. Most economists now accept the proposition,

which was rediscovered in the past decade, that market interest rates embody an inflation premium. According to this proposition, accelerating inflation is accompanied by rising market interest rates. To the extent that an accelerating trend growth of money results in accelerating inflation, the high interest rates of the past decade do not indicate monetary restraint. Instead, they indicate previous excessive monetary ease. Moreover, attempts by monetary authorities to resist rising market interest rates, following their recommended accommodative role, required larger purchases of government securities in the open market which ultimately resulted in faster money growth, greater inflation, and still higher interest rates.

Another lesson is that government deficits are an important cause of accelerating money growth. Large deficits, other factors held constant, tend to increase market interest rates, which in turn have been resisted by monetary authorities. Such resistance was consistent with the accommodative role assigned to monetary actions. These rapidly growing purchases of government securities provided much of the basis for the accelerating growth of money.

A final lesson regarding monetary actions is that if inflation is to be avoided, these actions should be directly concerned with inflation and carried out on a long-run basis. This is contrary to the prevailing view that monetary actions should be primarily concerned with output and employment and should be conducted on a short-run basis. Monetary actions during the last ten years have been directed, at various times, toward achieving such short-run objectives as lower market interest rates, protection of thrift institutions and the housing industry, or a reduction of the unemployment rate. In attempting to achieve these objectives, the trend rate of money growth has been ratcheted upward. The end result has been the present high trend rate of monetary expansion and high inflation.

CURRENT ASSESSMENTS AND POLICY PROPOSALS DIVERGE

It is my opinion that the economic outlook depends critically on how stabilization actions are altered in view of the aforementioned lessons. With these lessons in the background, let us now examine some of the implications for inflation and the economic outlook.

Over the past four or five months a wide divergence has developed in economists' evaluations of the underlying strength of the economy. There are those who have viewed the economy as being weak and getting weaker. Considerable concern has been raised

about the prospects for rising unemployment and falling real output. Other economists believe the economy is basically strong, and they are greatly concerned about inflation.

Now that the latest report on the national income accounts indicates, as was widely expected, that output of goods and services fell sharply in the first quarter, some politicians from both major political parties and many well-known economists have called for stimulative government action. They do so in spite of an acceleration of inflation to about an 11 percent annual rate in the first quarter.

They argue that the purchasing power of households is being so eroded by inflation that there is insufficient aggregate demand relative to our country's productive potential. According to that view, a tax cut is needed immediately to increase household purchasing power in order to boost aggregate demand and to prevent further deterioration of output and employment. Some who hold this view have also urged that the Federal Reserve actively seek lower market interest rates in order to achieve what they would consider to be an easier monetary policy designed to stimulate housing and capital investment. The analysis underlying this recommendation is based on the same approach that dominated thinking about stabilization policy over the past two decades.

In contrast to that position is the one I share with the other group of economic analysts. That is, the economy is fundamentally very strong and there is more than adequate aggregate demand to promote real expansion. I view the slower growth in real output after the first quarter of 1973 as being attributable to the economy operating "flat-out" at full capacity in an environment where price and wage controls severely reduced the efficiency of the market system in allocating resources in the production process.

I do not see how the existence of wide-spread shortages of commodities and sharply rising prices can be viewed as characteristics of weak aggregate demand. The sharp drop in real output in the first quarter of this year was clearly the result of the oil boycott and related developments such as the truckers' strike, the allocation program, and the presence of controls on both prices and resource movements. Only a few industries were affected and all of them were energy related. Furthermore, unemployment in the first few months of this year was much smaller than one would have expected if the sharp drop in real output had been widespread and had resulted from fundamental weakness in the economy.

One important aspect which has been overlooked in most analyses of the current economy is that all previous economic recessions have been preceded by a period of sharply reduced growth in the nation's money stock. In my view the growth of money is a reliable indicator of the tightness or ease of stabilization policies. Since the growth of money last year was not much slower, on balance, than in 1972, and the 7 percent average rate of growth in money over the past three and one-half years is the fastest for any such period since World War II, I don't think we have had such restrictive actions as would cause a recession. In fact, the approach I would take suggests that so far the steps necessary to bring an eventual end to the inflation have not been taken.

SELECTING AN APPROPRIATE COURSE OF ACTION

Now, given that there are two opposing assessments of the economic situation and, therefore, opposing prescriptions, one is faced with a choice. Suppose we were to adopt the policies of those who think the economy is weak and take actions to push interest rates down, accelerate money growth, and possibly cut taxes. Based on the lessons of the past, I believe that later this year we would find aggregate demand remaining excessive. In such circumstances, inflation would not subside significantly, and further upward adjustment in the premium on interest rates attribut-

able to expectations about inflation would give us still higher market interest rates. Consequently, the task of cooling the economy would be even more difficult than it is currently.

Given that situation, it would be necessary to shift to decisively anti-inflationary policies. To do so would mean going into 1975 with an even higher structure of interest rates, a more rapid rate of inflation, and, because of the newly adopted restrictive policies, declining growth in output and rising unemployment. If my assessment of the economic situation is correct and we follow policies of those who want to fight a recession now, then the probability of both a recession and a faster rate of inflation in 1975 is greatly increased.

Let's consider the opposing approach. Those of us who see aggregate demand as being very strong and inflation as the most serious problem would argue that the trend rate of money growth should be reduced immediately to about a 5 percent rate for the balance of this year. The actions necessary to achieve this might involve even higher short-term market interest rates for a few months, but then late in the year or early next year we would be making tangible progress toward both less inflation and lower interest rates. Past experience suggests that following this course would minimize the risk of further acceleration in the rate of inflation while also setting the stage for further real output growth next year.



Trust Revenue of Commercial Banks: The Influence of Bank Holding Companies

R. ALTON GILBERT

IN ADMINISTERING the Bank Holding Company Act, the Federal Reserve Board weighs the public benefits from proposed acquisitions by bank holding companies (hereafter called BHCs) against possible adverse competitive effects.¹ BHCs are asked to discuss public benefits of proposed acquisitions in applications to acquire banks and nonbanking firms. A public benefit commonly mentioned in applications for the acquisition of additional banks is increased trust services to be offered to customers in the areas of the proposed subsidiaries.²

Banks outside metropolitan areas and banks with relatively few customers generally do not have enough potential trust customers to justify hiring a staff to specialize in trust services. In some applications BHCs indicate plans for sharing the expertise of trust department employees of their larger banks with the proposed subsidiaries. In other cases the BHCs plan to offer trust services directly through the trust departments of their larger banks. It is contended that under both policies the potential customers of the banks to be acquired would have opportunities of receiving better trust services as a result of the affiliation of local banks with BHCs.

¹Section 3(c)(2) of the Bank Holding Company Act of 1956 as amended reads as follows: The Board shall not approve any other proposed acquisition or merger or consolidation under this section whose effect in any section of the country may be substantially to lessen competition, or to tend to create a monopoly, or which in any other manner would be in restraint of trade, unless it finds that the anticompetitive effects of the proposed transactions are clearly outweighed in the public interest by the probable effect of the transaction in meeting the convenience and needs of the community to be served.

²See orders on bank holding company cases published in the *Federal Reserve Bulletin*.

The objective of this paper is to determine whether the amount of trust business in areas served by banks affiliated with BHCs is significantly different from that in areas not served by affiliated banks. Several variables, in addition to the affiliation of banks with BHCs, are included in regression analyses to estimate the influence of BHCs on the trust business of banks in areas served by their subsidiaries.

The paper is divided into three sections. The first section discusses the measure of trust business and the variables used to explain the level of trust business. The second describes the sample of banks used to estimate the influences of these variables on the trust business of banks. The third section presents empirical tests of hypotheses.

DETERMINANTS OF THE LEVEL OF TRUST BUSINESS IN INDIVIDUAL AREAS

The model specifies the factors which are presumed to influence the demand for trust services by individual bank customers and the supply of trust services by individual banks. The theoretical demand and supply functions are aggregated across individuals, firms, and banks, and a reduced form equation is specified which indicates how the demand and supply factors influence the level of trust services. The measure of trust business in an area is the revenue of bank trust departments per capita; trust revenue equals the quantity of trust services multiplied by the price of trust services. Measurement of the influences on the demand for and supply of trust services is discussed in the section where these influences are combined in a reduced form equation. Some influences on the trust

business of banks are mentioned, but not measured, due to a lack of data.

Demand for Trust Services

Individuals demand trust services to secure management of their wealth. Some trust arrangements are established by wills which give trust departments authority to sell the assets of estates and distribute the proceeds to the beneficiaries. Other trust accounts are established as living trusts under which individuals, while still alive, transfer legal title to part of their wealth to trust departments to be invested and disposed of as the trust agreements specify. Under another type of arrangement, a trust department does not own the assets of an individual, but acts as an agent in managing his portfolio or giving investment advice.³

The demand for trust services by an individual is assumed to be positively related to his wealth and, holding wealth constant, positively related to his age. Holding constant the influence of wealth, an individual is more likely to establish a living trust as he gets older and considers the problems associated with transferring an estate to his family. Also, influences like poor health may induce older people to use trust departments as agents for investing their wealth. The demand for trust services by an individual at banks in the area in which he lives is assumed to be negatively related to the price of trust services in that area; positively related to the prices of trust services in nearby cities and to the prices of alternatives to trust services; and positively related to the length of time the individual has been in the area. If this individual has moved into the area recently, he is more likely to have established a trust account at a bank outside of the area than someone who has lived in the area all of his life. The prices of trust services in nearby cities and the prices of alternatives to trust services are not measured in this paper and therefore are not mentioned again as determinants of trust services.

Business firms demand trust services mainly for the management of funds in employee benefit programs. This source of demand at banks in an area is assumed to be positively related to the percentage of employees in the area that are accumulating pension benefits. Although trust departments provide other services for

business firms, no variables are included in the analysis to explain the demand for those services.

The total demand for trust services at banks in a particular area is assumed to be a function of the following variables:

- (a) *the total wealth of people in the area and surrounding areas (+)*;
- (b) *the percentage of individuals in the area and surrounding areas that have enough wealth to make management of their wealth by trust departments profitable for trust departments and an efficient means for individuals to invest their wealth (+)*. Some of the costs to a bank of establishing a trust account do not depend upon the size of the estate to be managed. Such costs include those of talking to the customer about the purpose of the trust and distributing the profits from the investments. At the prices trust departments would have to charge to just cover the cost of managing small estates, other ways of investing would be more efficient for those individuals with relatively small amounts of wealth. Therefore, the effective demand for trust services is assumed to depend upon the allocation of wealth. These two variables, (a) and (b), are independent if the degree of inequality in the distribution of wealth varies sufficiently among individual areas.
- (c) *the average age of people in the area (+)*;
- (d) *the price of trust services in the area (-)*;
- (e) *recent migration into the area (-)*, a measure inversely related to the length of time individuals have lived in the area.
- (f) *the degree to which people in surrounding areas come into the area for reasons other than just shopping for trust services (+)*. Some of the potential trust customers of banks in a particular county live in surrounding counties. There are costs to these potential customers of coming to establish trust accounts in terms of travel time and explicit travel costs. These costs are smaller for people from surrounding counties who regularly come into the county for reasons other than shopping for trust services, such as commuting to work, entertainment, and general shopping.
- (g) *the influence of BHCs (-)*. Some BHCs instruct their smaller bank subsidiaries to refer

³For more details on the operations of bank trust departments see Edna E. Ehrlich, "The Functions and Investment Policies of Personal Trust Departments, I and II," Federal Reserve Bank of New York *Monthly Review* (Oct. 1972 and January 1973).

trust customers to the trust departments of the large bank subsidiaries of the BHCs.⁴ If this is the general policy of BHCs, the amount of trust services demanded by local customers at local banks would tend to be lower at each price charged by local banks for trust services.

- (h) *the percentage of employees in the area that are accumulating pension benefits (+).*

Supply of Trust Services

Some of the functions performed in managing trust assets are the same as those involved in other operations of a bank, such as buying and selling government securities and evaluating the future profit prospects of companies. If the other departments of a bank have enough business to take advantage of some of the economies of scale in banking, the trust department of that bank would have a lower cost structure than the trust department of a smaller bank.

Any influence that lowers the costs to a bank of supplying trust services shifts its supply schedule for trust services so that more trust services are offered at each price. The supply of trust services by *an individual bank* is assumed to be a function of the following variables: the price of trust services (+); the costs of inputs, such as labor (—); the volume of transactions at the bank outside of the trust department (+); and affiliation of the bank with a BHC (+). The sign of this last variable is positive if BHCs help their subsidiary banks develop their own trust departments. Several studies indicate that there are economies of scale in bank trust departments.⁵ Suppose that a BHC helps its subsidiary banks lower their operating costs by pooling operations. This influence on the cost structure of a subsidiary bank would induce it to offer more trust services at each price than it would have without affiliating with the BHC. The costs of bank inputs are not measured and therefore are excluded from additional analysis.

⁴Gerald C. Fischer, *Bank Holding Companies* (New York: Columbia University Press, 1961), p. 130; Steven Weiss, "Bank Holding Companies and Public Policy," *New England Economic Review* (January/February 1969), p. 19.

⁵Frederick W. Bell and Neil B. Murphy, *Costs in Commercial Banking*, Federal Reserve Bank of Boston Report No. 41 (April 1968), p. 164; Marvin S. Margolis, "Trust Departments—A Suggested Approach for Determining Functional Profitability," Federal Reserve Bank of Dallas *Business Review* (April 1974), pp. 1-5; Neil B. Murphy, "Cross-Sectional Analysis of the Cost of Operations of Trust Departments," *Journal of Money, Credit and Banking* (February 1969), pp. 84-100; Keith V. Smith and Maurice B. Goudzwaard, "The Profitability of Commercial Bank Trust Management," *Journal of Bank Research* (Autumn 1972), pp. 166-77.

The total supply of trust services by banks in a given area is a function of the following variables:

- (a) *the price of trust services in the area (+),*
 (b) *the size of the largest bank in the area (+),*
 (c) *the size distribution of banks in the area.* Holding constant the size of the largest bank, the quantity of trust services supplied by banks in an area at each price is assumed to be greater the more equal the size distribution of banks in this area. The influence of the size of all banks in the area on the total supply of trust services is captured by items (b) and (c).
 (d) *the existence of banks in the area that are affiliated with BHCs (+).* As explained above, the direction of influence of this variable depends upon the policies of BHCs. The positive sign holds if BHCs help the trust departments of their individual subsidiary banks attract customers.

Reduced Form and Empirical Proxies

As indicated above, the trust business of banks in an area is measured by the revenue of their trust departments per person living in the area.⁶ Demand and supply functions for trust services can be estimated only with separate measures of price and quantity of services. These are not available. However, the revenue of bank trust departments can be specified as a function of variables listed above which influence the supply of and demand for trust services.

Changes in variables that induce an outward shift in the demand function cause trust revenue to rise. The influence of shifts in the supply curve depends upon whether the supply curve intersects the demand curve on its elastic or inelastic portion. If the supply curves intersect the elastic portion of the demand curves in all areas under analysis, changes in supply variables that cause the supply curves to shift to the right will increase trust revenue. There is no data to indicate whether this assumption is warranted. Therefore, the direction of influence of supply factors on the trust revenue of banks must be determined empirically; neither positive nor negative signs are hypothesized.

The following list indicates the measurable variables hypothesized to influence trust revenue per cap-

⁶Data on trust income is taken from the Report of Income by all commercial banks that are insured by the Federal Deposit Insurance Corporation.

ita and the directions of influence. A discussion of empirical measurement follows the identification of each variable.

- (a) *Wealth per capita in the area (+)*. Data on wealth are not available by county, but measures of income by county are available for population census years.⁷ *Trust revenue per capita is hypothesized to be positively related to median family income.* A ranking of counties by median family income would approximate the ranking by wealth per capita if no migration takes place, if the share of income saved does not vary among counties, and if the ranking of counties by median family income has remained the same over time.

The last assumption is relaxed by adding the rate of change in median family income as an explanatory variable. If two counties had the same median income in 1969, the county with the more rapid growth in median income from 1959 to 1969 would have a lower level of median income in 1959 than the area with slower growth. Accumulated nonhuman wealth would generally be lower in the area with the faster growth in median family income. *Therefore, trust revenue per capita is hypothesized to be negatively related to the rate of change in median family income, holding constant the current level of median family income.*

- (b) *The percentage of individuals in the area and surrounding areas that have enough wealth to make management of their wealth by trust departments profitable for trust departments and an efficient means for individuals to invest their wealth (+)*. This variable is measured as the percentage of families with incomes over \$50,000 in 1969. This income level is used because it is a measure of income distribution available from the census reports which is not highly correlated with median family income. Two separate percentages are calculated, one for the county under study and another for the surrounding counties.
- (c) *The percentage of people in the area old enough to consider trust accounts as a means of managing their assets (+)*. This variable is

measured as the percentage of population 45 years old or older in the area under study. No alternative measures of age were used.

- (d) *Migration into the area (-)*. This variable is measured as the percentage of residents in a county in 1970 who lived in another county in 1965.
- (e) *The degree to which people in surrounding counties come into the county under study for reasons other than shopping for trust services (+)*. This variable is measured as the population density of the county under study less the population density of surrounding counties. If people shop in an area outside the county in which they live or commute into another area to work, they are likely to go to a county with a higher population density than their home county.⁸
- (f) *The percentage of workers likely to be accumulating pension benefits (+)*. A uniform industrial classification of employees is presented by county in the 1970 census. Domestic and farm workers are considered least likely to have pension plans. This variable is measured as the percentage that domestic and farm workers comprise of total employees and is assumed to be negatively related to observed trust services.
- (g) *The size of the largest bank in the area is measured as total deposits on December 1971.*
- (h) *The size distribution of banks in the area.* This variable is measured by the Herfindahl Index, computed by squaring the percentage of total deposits held by each bank in the county as of December 1971 and then summing over all banks in the county. The more equally deposits are distributed among banks in a county, the lower this index.
- (i) *The existence of banks in the area affiliated with BHCs (+ or -)*. This variable is represented by dummy variables, one with a value of unity if one or more banks in a county were affiliated with a BHC on December 1971, zero otherwise, and the other dummy variable with a value of unity if one or more banks in the county were affiliated with BHCs on December 1970, a value of zero otherwise. The second

⁷The term wealth is used in this paper to refer to nonhuman wealth. For many people the largest portion of their total wealth is their human wealth, that is, the present value of the future earnings they will receive from working. Individuals have a use for trust departments only when a large portion of their wealth is held in nonhuman form.

⁸This hypothesis about shopping behavior is implied from the Central Place Theory. See Hugh O. Nourse, *Regional Economics* (New York: McGraw-Hill Book Co., 1968), pp. 33-62.

Table I

Characteristics of Counties in the Study

| State | Total no. of counties | No. of counties in the study | Of Counties in the Study: | |
|-----------|-----------------------|------------------------------|--|-----------------------------------|
| | | | No. of banks affiliated with BHCs, 12/71 | No. of banks affiliated with BHCs |
| Iowa | 99 | 75 | 15 | 18 |
| Missouri | 115 | 26 | 7 | 7 |
| Tennessee | 95 | 24 | 4 | 5 |
| Total | 309 | 125 | 26 | 30 |

dummy variable is added to allow for the possibility that the influence of affiliation with BHCs on trust services offered takes at least a year to affect the trust revenue of subsidiary banks. These variables are included separately as independent variables in regression equations.

No hypothesis is made about the direction of influence of these dummy variables on trust revenue per capita. Positive regression coefficients for these variables would indicate that BHCs have helped their smaller subsidiary banks to increase their own trust business. An alternative hypothesis with the same implication is that local banks other than those affiliated with BHCs would improve their trust departments under the threat that the subsidiary banks would start providing this service if they did not. Negative regression coefficients would provide support for the proposition that BHCs have attracted the potential trust customers of their smaller subsidiary banks to their larger banks. A regression coefficient not significantly different from zero could indicate either that the BHCs have followed different policies in dealing with trust customers or that BHCs have had no significant influence on the trust services offered to potential customers of their subsidiary banks.

THE SAMPLE OF BANKS

The banks in this study are located in 125 counties in the following states: Iowa (75); Missouri (26), and Tennessee (24). These states are in the sample because BHCs have acquired banks there during recent

years, and these states appear to have somewhat similar economic characteristics.⁹ All nonmetropolitan counties in the three states in which at least one bank reported trust revenue on the 1971 *Report of Income* are included in the sample.¹⁰ As indicated in Table I, 26 of the 125 counties had banks affiliated with BHCs as of December 1971. Two or more banks were affiliated with BHCs in only three of these counties as of December 1971. Banks were affiliated with BHCs in 22 counties as of December 1970.

The sample is restricted to nonmetropolitan counties because BHCs commonly list increased trust services as public benefits when applying to acquire banks in those areas. Furthermore, relatively few banks in nonmetropolitan areas offer trust services, and it is in these areas that BHCs can be expected to have the greatest effect on the total supply of trust services offered if they have any effect at all.

The names and sizes of the BHCs represented in the study are given in Table II. In most counties in which BHCs were represented, only one bank was a subsidiary of a BHC. In one county in Tennessee

Table II

Characteristics of the Bank Holding Companies in the Sample

| State | Name of Bank Holding Company | No. of Counties Represented In | Total Deposits of Subsidiary Banks — 12/71 (thousands of \$) |
|-----------|--------------------------------|--------------------------------|--|
| Iowa | Banks of Iowa | 1 | 288,117 |
| | Brenton Banks, Inc. | 8 | 237,373 |
| | Hawkeye Bancorporation | 5 | 111,130 |
| | Northwest Bancorporation | 1 | 4,398,980 |
| Missouri | Commerce Bancshares, Inc. | 5 | 947,725 |
| | First Community Bancorporation | 1 | 68,816 |
| | First Union, Inc. | 1 | 1,021,557 |
| Tennessee | Hamilton Bancshares | 3 | 568,033 |
| | United Tennessee Bancshares | 2 | 437,898 |

⁹Some counties in Florida were originally included in the empirical analysis but were later excluded because those counties increased the standard error of estimate substantially. This result is probably due to a large number of retired people in Florida who have a higher ratio of nonhuman wealth to income than people in the other three states in the study. With data for Florida included in the sample and dummy variables added for states, only the dummy variable for Florida counties has a regression coefficient that was significantly different from zero.

¹⁰Nonmetropolitan counties are those outside Standard Metropolitan Statistical Areas.

Table III

Regression Results

| Equation No. | MFI | (MFI) ² | ΔMFI | INC50 | (INC50) ² | AGE | PDEN | MIG | SURR50 |
|--------------|--------------------|--------------------|----------------------|----------------------|----------------------|--------------------|--------------------|----------------------|----------------------|
| 1 | 0.00630 (4.39) | | -0.01767 (-0.250) | -0.05178 (-0.308) | | 0.04153 (2.608) | 0.00014 (0.103) | -0.01388 (-1.078) | -0.02429 (-0.194) |
| 2 | 0.00031 (4.565) | | -0.01271 (-0.181) | | -0.06741 (-0.962) | 0.04211 (2.652) | 0.00018 (0.129) | -0.01437 (-1.119) | -0.02915 (-0.233) |
| 3 | | 0.38141 (4.693) | -0.01350 (-0.193) | -0.09101 (-0.542) | | 0.04390 (2.773) | 0.00036 (0.261) | -0.01559 (-1.218) | -0.02677 (-0.216) |
| 4 | | 0.37598 (4.582) | -0.01059 (-0.151) | -0.11390 (-0.658) | | 0.04435 (2.790) | 0.00028 (0.200) | -0.01561 (-1.216) | -0.02922 (-0.234) |
| 5 | | 0.38047 (4.590) | -0.01347 (-0.192) | -0.09357 (-0.540) | | 0.04399 (2.757) | 0.00035 (0.254) | -0.01557 (-1.210) | -0.02710 (-0.217) |
| 6 | | 0.36931 (4.741) | -0.01769 (-0.256) | | | 0.04358 (2.763) | 0.00025 (0.188) | -0.01544 (-1.211) | -0.02441 (-0.197) |
| 7 | | 0.36698 (5.176) | | | | 0.00670 (0.469) | 0.00344 (2.749) | -0.01148 (-0.879) | |
| 8 | | 0.38134 (5.604) | | | | 0.03077 (1.973) | 0.00241 (1.909) | | |
| 9 | | 0.31314 (4.952) | | | | 0.04252 (3.018) | | | |

| Equation No. | WWP | SLB | HERF | BHC71 | BHC70 | R ² | F | Standard Error | Intercept |
|--------------|----------------------|--------------------|--------------------|--------------------|--------------------|----------------|--------|----------------|-----------|
| 1 | -0.00971 (-1.038) | 0.00002 (3.483) | 0.41420 (0.736) | | | 0.362 | 6.481 | 0.681 | -3.26195 |
| 2 | -0.00960 (-1.041) | 0.00002 (3.457) | 0.40546 (0.723) | | | 0.367 | 6.611 | 0.679 | -3.36587 |
| 3 | -0.00936 (-1.015) | 0.00002 (3.371) | 0.48779 (0.872) | | | 0.375 | 6.850 | 0.675 | -2.35161 |
| 4 | -0.00804 (-0.844) | 0.00002 (3.394) | 0.48364 (0.862) | 0.09553 (0.571) | | 0.377 | 6.220 | 0.677 | -2.40683 |
| 5 | -0.00923 (-0.976) | 0.00002 (3.348) | 0.48678 (0.866) | | 0.01146 (0.065) | 0.375 | 6.174 | 0.678 | -2.35583 |
| 6 | -0.01011 (-1.114) | 0.00002 (3.407) | 0.48826 (0.876) | | | 0.374 | 7.626 | 0.673 | -2.30467 |
| 7 | | | | | | 0.230 | 8.942 | 0.730 | -0.70466 |
| 8 | -0.02191 (-2.744) | | | | | 0.270 | 11.121 | 0.711 | -1.41604 |
| 9 | | 0.00003 (5.785) | | | | 0.356 | 22.342 | 0.665 | -2.63385 |

Meanings of Symbols

- MFI — median family income, 1969
- ΔMFI — the annual rate of change in median family income, 1959 to 1969
- INC50 — the percentage of families with incomes in 1969 of \$50,000 or more
- AGE — the percentage of population 45 years and older in 1970
- PDEN — the difference between population density in a county and that in surrounding counties in 1970
- MIG — the percentage of population in a county 5 years old and older in 1970 that lived in a different county in 1965
- SURR50 — in surrounding counties, the percentage of population with incomes of \$50,000 or more in 1969
- WWP — the percentage of workers in a county employed as domestics or in agriculture in 1970
- SLB — the size of the largest bank in a county, measured as total deposits as of December 1971
- HERF — the Herfindahl Index
- BHC71 — a dummy variable with a value of unity if one or more banks in a county were affiliated with BHCs as of December 1971, zero otherwise
- BHC70 — Same as BHC71 except as of December 1970

Hamilton Bancshares and United Tennessee Bancshares have each owned a bank. Brenton Banks, Inc. owned three banks in one county and two banks in another county in Iowa. The third column of Table II gives the number of counties in the study in which each BHC is represented. Total deposits of subsidiary

banks in the BHCs as of December 1971 ranged from \$111.13 million to \$4.4 billion.

EMPIRICAL RESULTS

The influence of the various independent variables on trust revenue per capita is estimated by using

ordinary least squares regression analysis. The regression results are presented in Table III (p. 13). The t-statistics are presented in parentheses below the regression coefficients.

Approximately 37 percent of the variation in trust revenue per capita is explained in equations that include all of the independent variables. There is collinearity among the independent variables, making it difficult to determine the contribution of individual independent variables to explaining trust revenue (see Table IV for an indication of the pairwise collinearity). An equation which includes only the following three variables explains about 35 percent of the variation in the dependent variable: median family income, the percentage of population 45 years and older, and the total deposits of the largest bank in the county.

Several variables were included in the equations in nonlinear form to see if the fit of the equations would be improved. The fit of the equations is better with median family income squared. Squaring the percentage of families with incomes over \$50,000 does not improve the fit of the equation substantially.

Two variables are highly correlated with the size of the largest bank: (a) the population density in a county less than population density in surrounding counties and (b) the percentage of workers employed as domestics and in agriculture, a proxy for workers without pension plans (see Table IV). The estimated regression coefficients of these variables have the hypothesized signs and are statistically significant in two equations that delete the size of the largest bank in the county as a variable (see Equations 7 and 8), but are not statistically significant when that variable is added to the equation. The results in equations 7-9 illustrate that with collinearity the t-statistics for regression coefficients vary greatly depending upon which independent variables are included. Under those circumstances it is difficult to say that one variable explains trust revenue and another does not.

Dummy variables that indicate the presence of banks that have been acquired by BHCs have regression coefficients which are not significantly different from zero (see Equations 4 and 5). These results are consistent with either of the following two interpretations: (a) some BHCs have attracted the potential trust customers of their smaller subsidiary banks to be customers of their larger subsidiaries, while other BHCs have helped their smaller subsidiaries attract customers for their own trust departments, and these influences are of equal strength, or (b) BHCs have

Correlation Matrix

| | TRPC | MFI | ΔMFI | INC50 | AGE | PDEN | MIG | SURR50 | WWP | SLB | HERF | BHC71 | BHC70 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| TRPC | 1.000 | 0.406 | -0.263 | 0.030 | -0.118 | 0.217 | 0.075 | -0.017 | -0.232 | 0.459 | 0.065 | 0.185 | 0.139 |
| MFI | 0.406 | 1.000 | -0.352 | 0.235 | -0.330 | 0.022 | 0.292 | 0.142 | -0.024 | 0.241 | -0.293 | 0.224 | 0.263 |
| ΔMFI | -0.263 | -0.352 | 1.000 | 0.049 | 0.132 | -0.226 | -0.204 | 0.013 | 0.295 | -0.273 | 0.107 | -0.214 | -0.141 |
| INC50 | 0.030 | 0.235 | 0.049 | 1.000 | 0.057 | 0.048 | -0.018 | 0.053 | 0.233 | -0.069 | -0.141 | 0.195 | 0.225 |
| AGE | -0.118 | -0.330 | 0.132 | 0.057 | 1.000 | -0.087 | -0.318 | 0.064 | 0.483 | -0.494 | -0.010 | -0.222 | -0.231 |
| PDEN | 0.217 | 0.022 | -0.226 | 0.048 | -0.087 | 1.000 | 0.105 | -0.133 | -0.278 | 0.468 | 0.086 | 0.188 | 0.128 |
| MIG | 0.075 | 0.292 | -0.204 | -0.018 | 1.000 | 0.105 | 1.000 | -0.028 | -0.343 | 0.178 | 0.066 | 0.181 | 0.146 |
| SURR50 | -0.017 | 0.142 | 0.013 | 0.053 | -0.028 | -0.133 | -0.028 | 1.000 | 0.239 | -0.113 | -0.119 | -0.024 | 0.007 |
| WWP | -0.232 | -0.024 | 0.295 | 0.233 | 0.483 | -0.278 | -0.343 | 0.239 | 1.000 | -0.572 | -0.253 | -0.299 | -0.222 |
| SLB | 0.459 | 0.241 | -0.273 | -0.069 | 0.178 | 0.468 | 0.178 | -0.113 | -0.572 | 1.000 | 0.263 | 0.209 | 0.161 |
| HERF | 0.065 | -0.293 | 0.107 | -0.141 | 0.066 | 0.086 | 0.066 | -0.119 | -0.253 | 0.263 | 1.000 | -0.006 | -0.029 |
| BHC71 | 0.185 | 0.224 | -0.214 | 0.195 | 0.181 | 0.188 | 0.181 | -0.024 | -0.299 | 0.209 | -0.006 | 1.000 | 0.902 |
| BHC70 | 0.139 | 0.263 | -0.141 | 0.225 | 0.146 | 0.128 | 0.146 | 0.007 | -0.222 | 0.161 | -0.029 | 0.902 | 1.000 |

Table IV

had no influence on the markets for trust services of their smaller bank subsidiaries through either channel. The tests for the statistical significance of the regression coefficients cannot discriminate between these two hypotheses.

Collinearity among the independent variables may be the influence which causes the t-statistics of the regression coefficients for the dummy variables representing BHC affiliation to be so small as to indicate lack of statistical significance. Given that possibility, a relevant question is: what is the economic significance of those dummy variables for trust revenue if the question of statistical significance is ignored? The dependent variable is measured as dollars of trust revenue per capita. Therefore, the regression coefficient of the dummy variable BHC 71 indicates that trust revenue per capita was about \$0.10 higher on average in areas in which one or more banks were subsidiaries of BHCs, holding other factors constant. The difference was about \$0.01 using the dummy BHC 70. These differences are so small as to indicate little economic significance, especially since for the sample of counties trust revenue per capita ranges from \$0.005 to \$4.823.

Equations 1-3 and 6-9 in Table III were reestimated using average trust revenue per capita in the years 1969-71 as the dependent variable. This was done to determine whether a significant amount of random variation could be removed by averaging over several years. The regression results with this dependent variable are not substantially different from those results in Table III. The predictive ability of the independent variables is not substantially higher with the dependent variable, trust revenue, averaged over three years, indicating little variation in the trust revenue of banks over several years.

SUMMARY AND CONCLUSIONS

The purpose of this paper is to estimate the influence of bank holding companies (BHCs) on the trust revenue of banks in areas in which banks are affiliated with BHCs. Remarks in other studies indicate that BHCs could be expected to either increase or decrease the trust activities of their smaller subsidiary banks, depending upon the policies of the BHCs. *Empirical results of this paper indicate that the trust revenue of banks in counties in which one or more banks are affiliated with BHCs is neither higher nor lower than in other counties, holding other factors constant. This indicates either that BHCs follow different policies concerning the trust business of their smaller banks or that they have had no influence on the trust revenue of banks.*

This paper presents equations for estimating the level of trust business of banks in county areas using several variables which are assumed to influence the demand for or supply of trust services. The trust business of banks is measured as the revenue of bank trust departments in each county per person living in the county. The following variables are the most useful for estimating the trust revenue per capita: median family income, the percentage of population 45 years and over, and the size of the largest bank in the area.

The results of this paper have an implication for the regulation of BHCs. The empirical results do not indicate an influence of BHCs on the trust revenues of banks in areas with subsidiaries of BHCs. Therefore, it is appropriate, to give little weight to promises by BHCs that they will increase trust services offered to customers of their subsidiary banks until some evidence is presented to support this contention.

