

ON LABOR MARKET INDICATORS

William E. Cullison

The unemployment rate is, perhaps, the most closely watched of all economic statistics. In many quarters, it is taken as a good indicator of current economic conditions and of overall well-being in the country. Among professionals, however, the unemployment rate is widely recognized as a controversial statistic that is often of limited accuracy as a measure of labor market conditions as well as of general welfare. As it is currently structured, the statistic is designed to measure the extent of the so-called "involuntary" unemployment in the economy. Thus, unemployment, as defined by the Bureau of Labor Statistics, includes only those persons who are not employed and are *actively* seeking work. This definition of unemployment is a source of pitfalls for the social as well as the economic interpretation of changes in the statistic.

One such pitfall relates to the so-called "discouraged" worker effect. "Discouraged" workers are workers who are unemployed but who have been frustrated with their job search and no longer actively seek work. These workers are not included in the unemployment statistics. The number of "discouraged" workers varies with the state of the economy, and because such workers are excluded from the unemployment statistics, the unemployment rate may understate labor market slackness during recessions and understate labor market tightness during recoveries.

The "discouraged" worker effect is not the only source of dissatisfaction with the unemployment rate's usefulness as an indicator. Others include the so-called "additional" worker effect (another member of the household enters the labor market to supplement the family's income when the principal breadwinner loses his job) and the definition of employment (part-time workers are defined as employed even if they desire full-time work). Professionals, of course, have been aware of these limitations for years. The criticisms have intensified recently, however, because the unemployment rate's usefulness as a coincident indicator has apparently diminished since 1969.

Before 1969, turning points in the unemployment rate tended to coincide with those in other important indexes of economic activity. During the 1970 recession and the subsequent recovery, however, the unemployment rate rose above 6 percent and re-

mained close to its cyclical peak until June 1972, well after recovery had begun. The 20-month plateau around the 6 percent peak level was the longest such aberration in the history of the series. Moreover, the unemployment rate has never since regained its low 1968 and 1969 levels. Throughout the first months of 1973, when other economic indicators were rising strongly and the economy was approaching full capacity, the unemployment rate continued to indicate a relatively slack labor market.

Gauging Labor Market Pressures Economic statisticians have long recognized that unemployment data should be interpreted in the light of the behavior of other labor market statistics, especially that of employment data. Geoffrey Moore, former U. S. Commissioner of Labor Statistics, has made a compelling argument that employment data are, as a matter of fact, superior to unemployment data as labor market indicators. In one of his more recent statements, written for the *Wall Street Journal*,¹ he reasons as follows:

... the concept of employment is firmer than the concept of unemployment. Having a job and being paid for it is, for the most part, an observable experience. . . . The concept of unemployment is quite different. For those who have had a job and have just been laid off, the situation may be obvious. Nevertheless, unless the worker is doing something to seek work, he will not be counted as unemployed. . . . Moreover, those who . . . have been laid off usually constitute less than half of the unemployed. The rest have either quit their jobs voluntarily or have not recently (or ever) had a job.²

Another important consideration, also noted by Moore, is that the employment numbers, being substantially larger than the unemployment numbers, contain less relative sampling error.

Most observers no doubt would agree with Moore respecting the technical superiority of the employment figures. But a practical problem in relying exclusively on employment data is there is no generally agreed upon standard against which to measure changes in employment. Moore has suggested a simple employment/population ratio as a yardstick, but such a ratio may itself suffer from serious limitations.

¹ Geoffrey Moore, "A Measuring Stick for Employment," *Wall Street Journal*, May 9, 1975.

² *Ibid.*

This article examines Moore's employment/population ratio in detail and proceeds to develop a somewhat more refined "labor market pressure index" that may offer an even more sensitive indicator of labor market conditions.

Moore's Employment/Population Ratio The data for Moore's employment/population ratio were derived simply by dividing the number of persons employed by the total working age population. For purposes of this article, that technique was modified slightly and the ratios were calculated by dividing those employed (16-64) by the population (civilian resident non-institutional) in that age bracket. This ratio, along with the unemployment rate, is plotted in Chart 1 for the period January 1955 to June 1975. The chart clearly shows that the employment/population ratio for all civilian workers, in contrast to the unemployment rate, exhibits a definite upward secular trend over the time period as a whole. The upward trend has been particularly pronounced since 1965, and as a result each succeeding month of 1974 set a new record high. This behavior pattern differs considerably from that of the unemployment rate, which has not yet regained its 1969 level.

The theoretical rationale usually associated with the well-known Phillips curve relationship argues that as an economy approaches full utilization of its labor resources, certain scarcities of critical skills develop. As firms endeavor to expand production, they must bid against one another for workers, thus introducing upward pressure on wages and, ultimately, prices. Conversely, slack conditions in labor markets cause wage and price pressures to subside. But the experience of 1973-1974 did not follow this script. Moore has indicated that part of this apparent anomaly may be attributable to the statistical deficiencies in the unemployment rate as an economic indicator. Indeed, his employment/population ratio conforms more closely than the unemployment rate to the relationship between inflation and labor market conditions that was widely accepted in the 1960's. The high levels of the employment/population ratio in 1973 and early 1974 coincide with the rapid rates of increase in the consumer price index at that time. As Moore notes:

High employment ratios have been associated with high rates of inflation. . . . There has been relatively little inflation when the percentage employed has been in the range 53.5% to 55.5%, but higher employment ratios have been associated with increasingly sharp advances in the rate of inflation. . . . In general, rates of wage and price inflation have been far more closely correlated with the employment ratio than with the unemployment rate. . . . In particular, 1974 was . . . in a class by

itself, with considerable unemployment and a great deal of inflation. What was largely overlooked was the record high employment ratio.³

A Critical View Moore's employment ratio represents a useful contribution to the interpretation of labor market statistics and provokes further refinement of this sort of analysis. Some of these refinements cast doubt on the inferences he draws respecting the relationship between the employment ratio and inflation pressures. For example, when the employment/population ratio for all civilian workers is separated into male and female components, plotted in Chart 1, the data no longer lend unambiguous support to Moore's inference.

The behavior of the ratio for all civilian workers over the period observed results from two conflicting trends. The male employment/population ratio exhibits a definite *downward* trend from 1955-1975. This ratio, in fact, was higher during the 1960-1964 time period, a period of relatively stable prices, than it was in the 1972-1974 time period.

The female employment/population ratio, in pronounced contrast to the male series, exhibits a substantial *upward* trend over the same time period. This upward tendency, of course, is associated with well-known changes in women's work preferences, and it is particularly pronounced since 1965. In any event, the upward trend in female employment more than offset the downward trend in the male ratio, and as a result the total employment/population series exhibited a moderate but definite upward trend. This domination of the total employment/population series by increased female participation leads to some ambiguity in interpreting the series.

The record ratios registered in 1973 and 1974, for example, can logically be interpreted in either of two conflicting ways. They may, as Moore suggests, indicate labor scarcities. On the other hand, the higher percentage employed may have been entirely attributable to an increased supply of females in the labor force and thus indicate nothing about labor market slackness or tightness. Viewed from this perspective, the closer association of prices with the employment ratio could possibly reflect nothing more than parallel trends in excess aggregate demand and increased female participation in the labor force in the late 1960's and early 1970's.

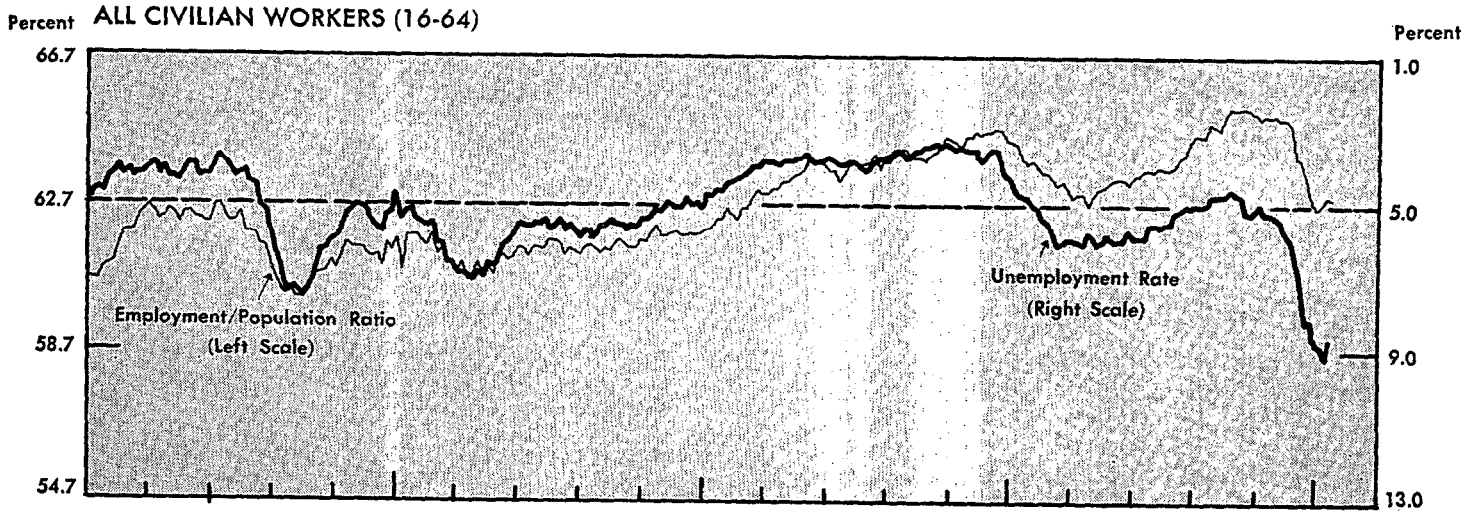
Employment ratios adjusted for long-term trends in labor force participation and calculated for major labor force groups might represent a useful refinement of Moore's efforts to improve the interpretation

³ *Ibid.*

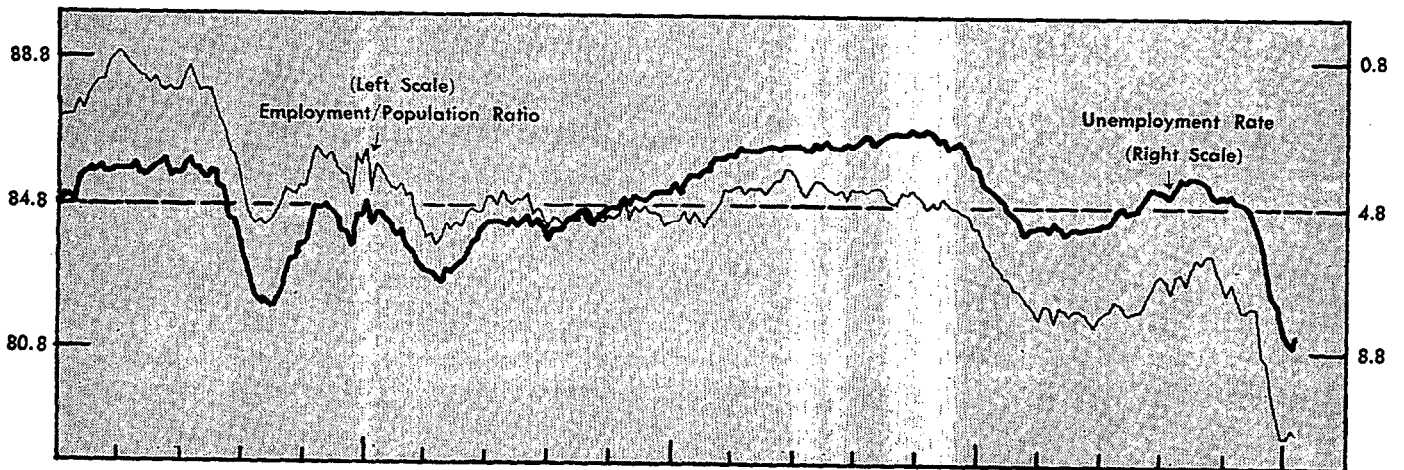
Chart 1

EMPLOYMENT/POPULATION RATIO AND UNEMPLOYMENT RATE (INVERTED)

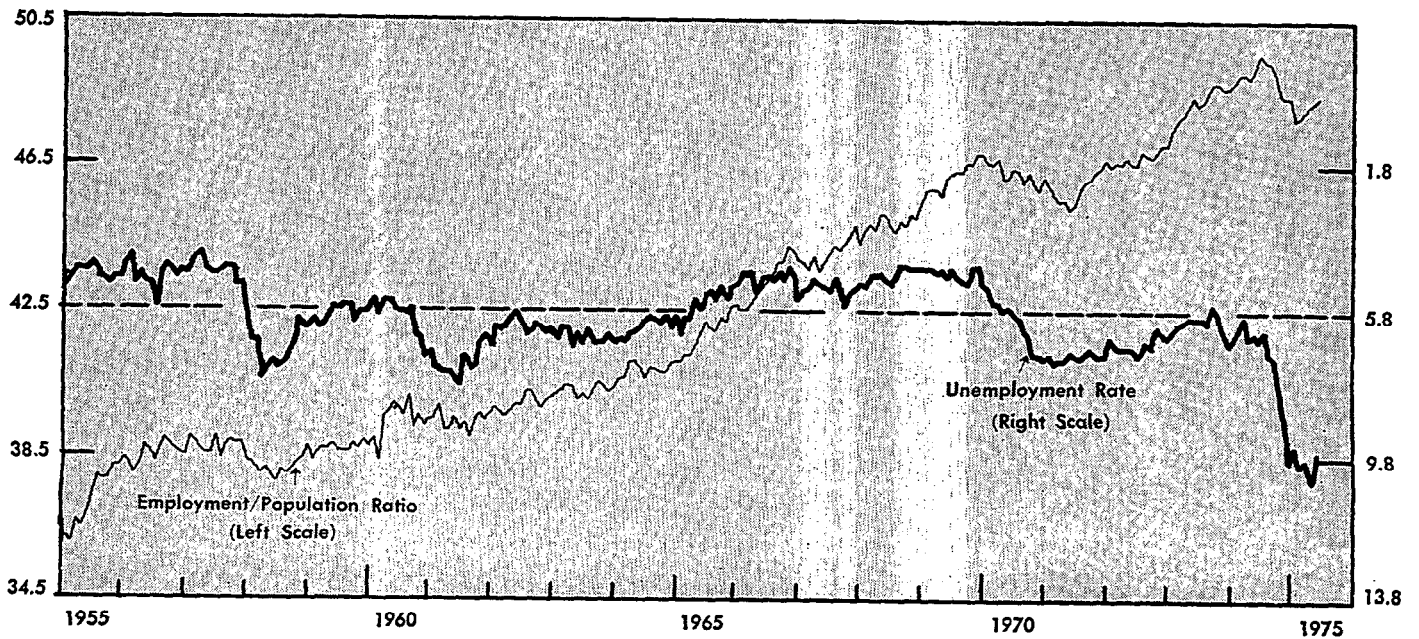
JANUARY 1955 - JUNE 1975



MALE CIVILIAN WORKERS (16-64)



FEMALE CIVILIAN WORKERS (16-64)



Source: U. S. Department of Labor.

of labor market data. A so-called "employment pressure index" directed toward this end is offered in the paragraphs that follow.

The Employment Pressure Index The employment pressure index is a measure of excess supply or excess demand for labor. An underlying assumption in the construction of the index is that actual employment is a proxy for labor demand and that population and trends in participation rates determine long-term labor supply. Its theoretical basis is described in detail elsewhere.⁴ Briefly, however, it is derived by dividing actual employment figures by estimates derived from long-term trend and changes in population.

The employment estimates were derived from the equation

$$E_T = a + b_1t + b_2t^2 + b_3P$$

where E_T is the employment estimate, t is time (January 1954 = 1), and P is population in the relevant group. The least squares multiple regression technique was used to estimate a , b_1 , b_2 , and b_3 . Separate estimations were made for each of sixteen employment categories grouped by sex, race, and age (16-19, 20-24, 25-34, 35-64) from monthly data for the 1955-1975 time period. The estimates for each of the categories were then summed to get an aggregate estimate for each month, and the total was divided into the actual employment figure for the appropriate month to determine the pressure index. The resulting data for the period January 1955 through June 1975 are shown in the Appendix. Chart 2 shows the employment pressure index for total employment in comparison to the unemployment rate.

Interpreting the Pressure Index The employment pressure index takes changing work preference patterns into account, because long-run changes in labor supply are incorporated into the trends. Because of this, the pressure index data parallel the unemployment rate data much more closely than employment/population ratios. Even so, there have been some important differences between the unemployment rate and the employment pressure index (EPI), particularly since 1970.

During the 1970-1971 recession, when the unemployment rate leveled off at approximately 6 percent, the EPI continued to fall, not reaching a definite lower turning point until June 1971. After that,

according to the pressure index, a vigorous recovery in the labor market ensued, reaching a peak in January 1974 and remaining at relatively high levels until August of that year.

Thus, the pressure index indicated that labor market conditions were much tighter during the fourth quarter of 1973 and the first quarter of 1974 than did the unemployment rate. The index had, by then, recovered to its 1968 level, while the unemployment rate averaged 5.0 percent compared with 3.6 percent in 1968. Hence, it appears that the EPI may have been the better indicator of the extent of the recovery from the 1969-1970 recession, although both indicators pointed to a substantial deterioration in employment conditions beginning in September 1974.

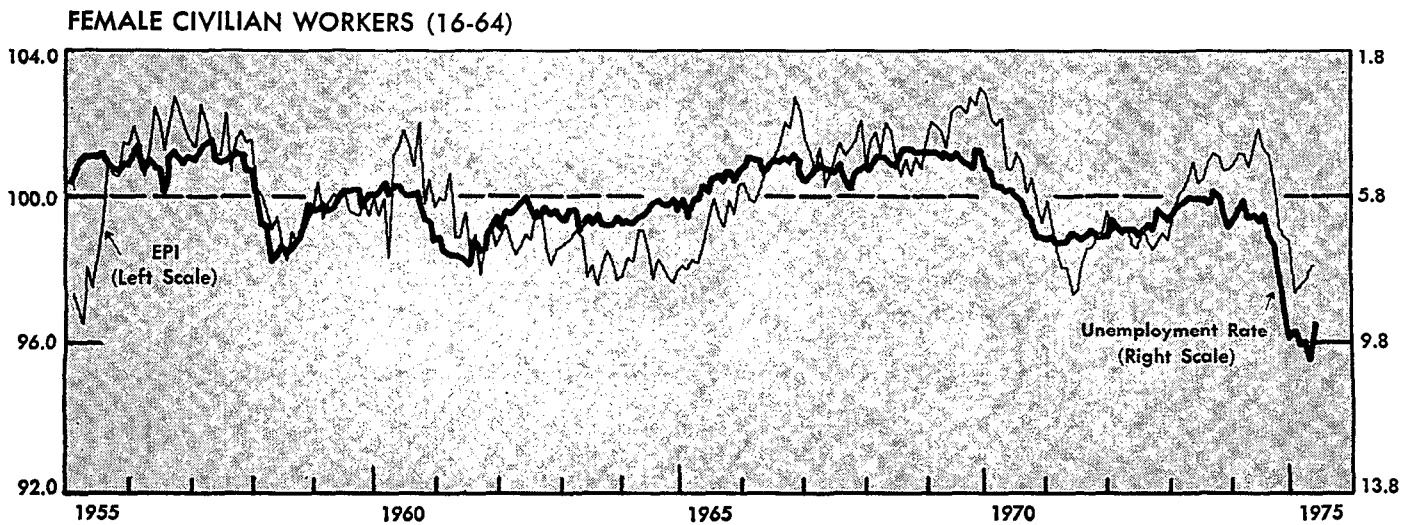
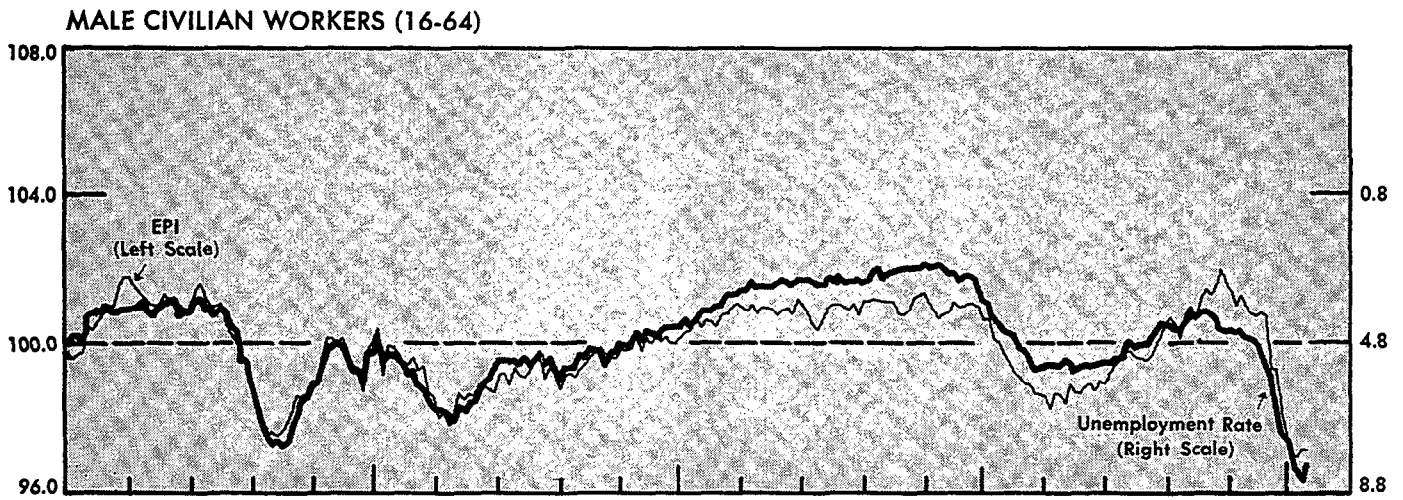
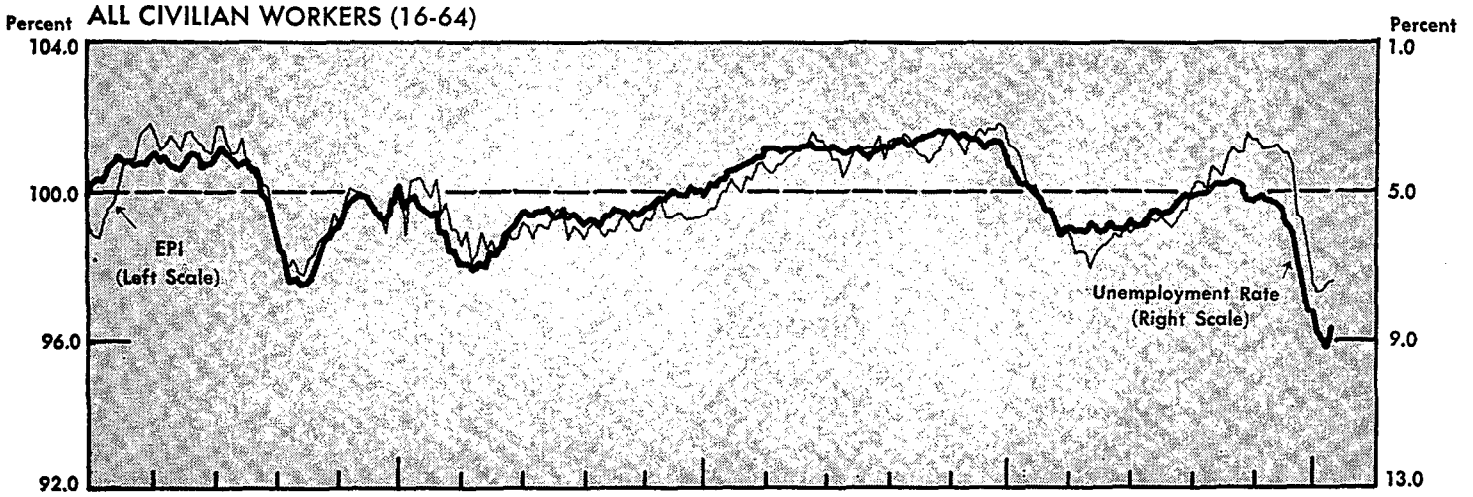
Chart 2 also shows employment pressure indexes and unemployment rates for males and females separately. Although the relationship between the EPI and the unemployment rate is much closer for males than for females, it is obvious that a close relationship exists for both groups. Using the EPI, a picture emerges of tight labor markets for both male and female workers in 1974 that is consistent with Moore's conclusion about employment during that year. The employment pressure index for males reached a record level in January 1974, and the EPI for females recorded relatively high, although not record levels, throughout the first half of 1974.

The pressure index thus tends to corroborate Moore's conclusions that in early 1974 the employment statistics were considerably more consistent with the behavior of price and other economic data than were the unemployment data. The employment pressure index indicates a great deal of pressure on labor markets at that time, although a record level only for males. However, much of the inflation during 1974 has been attributed to scarcities of raw materials and other basic production inputs and foods. Increased production of basic commodities may have necessitated a more male-intensive labor force than production increases in other types of commodities would have, and according to the EPI, employable males were scarce in early 1974.

Finally, the recent behavior of the EPI is noteworthy. Although the unemployment rate indicates further deterioration in the employment scene in April and May (1975), the EPI indicated some improvement in each of the two months. Final conclusions are, of course, premature, but the employment pressure index may thus be indicating that the downturn ended in March and that recovery is under way.

⁴ See William Cullison, "An Employment Pressure Index as an Alternative Measure of Labor Market Conditions," *The Review of Economics and Statistics*, Vol. 57, No. 1, February 1975, for a detailed description of the theory underlying the employment pressure index.

Chart 2
EMPLOYMENT PRESSURE INDEX AND UNEMPLOYMENT RATE (INVERTED)
 JANUARY 1955 — JUNE 1975



Source: U. S. Department of Labor.

Summary A number of arguments have been cited for the use of employment in conjunction with unemployment statistics as economic indicators. Basically, these arguments are:

1. Employment data are firmer, involving fewer definitional problems.
2. Employment data are subject to less relative sampling error.
3. Employment data are not biased by the "discouraged" worker effect.

The difficulty with using employment data as an economic indicator, however, has been that there is no standard against which to measure changes in employment. Geoffrey Moore suggested that an employment/population ratio might provide an appropriate measuring stick for labor market conditions. A refinement on this ratio, represented as the employment pressure index and developed in this article, may provide additional insights in interpreting labor market conditions since 1969.

APPENDIX

EMPLOYMENT PRESSURE INDEX

	<u>Jan.</u>	<u>Feb.</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
1955	99.0	98.8	98.8	99.3	99.6	99.7	100.2	100.9	100.9	100.9	101.6	101.7
1956	101.9	101.6	101.2	101.3	101.6	101.4	101.1	101.6	101.7	101.5	101.3	101.1
1957	101.1	101.8	101.8	101.4	101.1	101.1	101.5	100.7	100.7	100.7	100.2	100.2
1958	99.4	98.7	98.3	98.0	98.2	97.9	97.8	98.2	98.3	98.7	98.8	98.9
1959	99.4	99.1	99.7	100.1	100.1	100.0	100.0	99.7	99.4	99.5	98.9	99.9
1960	99.8	100.2	98.8	100.3	100.4	100.4	100.1	99.9	100.4	99.4	99.7	99.0
1961	99.0	98.6	99.0	98.1	98.3	98.9	98.5	98.7	98.3	98.9	99.0	98.7
1962	98.8	99.2	99.1	98.7	99.1	99.1	99.0	99.4	99.6	99.3	98.7	99.1
1963	99.0	98.7	99.1	99.2	99.0	98.8	99.0	98.9	99.3	99.4	99.2	99.0
1964	99.0	99.3	99.2	99.6	99.8	99.4	99.3	99.4	99.5	99.3	99.3	99.3
1965	99.3	99.4	99.6	99.6	100.0	100.0	100.4	100.2	100.0	100.5	100.3	100.7
1966	100.9	100.6	100.5	100.8	100.8	101.0	101.1	101.2	101.3	101.3	101.7	101.5
1967	101.4	101.3	100.9	100.9	100.4	100.7	101.1	101.3	101.2	101.2	101.2	101.6
1968	100.9	101.4	101.5	101.3	101.6	101.5	101.2	101.1	101.0	100.8	101.1	101.2
1969	101.5	101.7	101.5	101.4	101.0	101.5	101.5	101.8	101.6	101.8	101.7	101.9
1970	101.8	101.3	101.2	101.0	100.4	100.1	100.2	99.9	99.5	99.6	99.3	98.9
1971	99.1	98.8	98.4	98.4	98.4	98.0	98.3	98.5	98.6	98.7	98.9	98.8
1972	99.2	98.9	99.1	99.1	99.4	99.3	99.2	99.4	99.2	99.1	99.2	99.5
1973	99.5	100.1	100.3	100.3	100.1	100.8	100.6	100.4	101.0	101.3	101.1	101.1
1974	101.7	101.5	101.5	101.2	101.2	101.3	101.4	101.1	101.1	100.8	99.4	99.3
1975	98.5	97.6	97.3	97.3	97.6	97.7						
			(97.30)	(97.34)	(97.58)	(97.65)						

A VALUATION APPROACH TO BANK HOLDING COMPANY ACQUISITIONS

Walter A. Varvel*

The commercial banking system in this country has undergone an unparalleled consolidation movement since the mid-1960's. Bank holding companies (BHCs) have been active since the turn of the century, yet they have become an important force in the banking structure only since 1965. The phenomenal growth in the number of corporations that hold stock in one or more banks and the increased concentration of banking resources in such entities have prompted much discussion and a wealth of analytical studies of the potential impact of this development on the nation's financial system. Central to many of these studies has been the question of how acquisition by a holding company may affect the performance of an acquired commercial bank. Related to this issue, and often confused with it, is the question of the motivation for such acquisitions. The latter question has yet to be adequately answered.

Most efforts to explain the economic basis for bank holding company acquisitions have evolved from a framework designed to measure the resulting impact on the community served by an acquired bank. Attention has been centered on the consistent findings that the profitability of a bank has not been improved, relative to similarly situated independent banks, through acquisition to an extent that would clearly justify acquisition by a wealth-maximizing bank holding company. But conclusions based on measurements of bank profitability alone ignore the possibility that owners' claims on earnings streams are altered significantly by the transaction.

This article examines the hypothesis that the incentives for acquisition lie primarily in potential benefits accruing to *owners*, i.e., shareholders, who have claims on the earnings streams of the two firms involved. The framework for the analysis centers on a comparison of the valuation of expected future earnings streams for both sets of stockholders under the alternative assumptions, first, that the acquisition is not consummated and, second, that it is consummated. Rational behavior implies that owners will exchange claims to earnings only if they value those received more than those released.

Some Previous Evidence Among efforts to establish the existence of a "valuation disparity" sufficient to justify a BHC acquisition have been those by Thomas Piper and Steven Weiss.¹ In a study of acquisitions during the period 1947 through 1967, Piper argued that the economic incentives for acquisitions of banks "center on the resultant changes, both in the cash flows and earnings of the acquired banks and in the valuation of these cash flows" [3, p. 98]. He emphasized the importance of comparing the *value* of alternative ownership interests. For the acquisitions studied, Piper compared the value received by the stockholders of the bank being acquired with the value they relinquished and found that the value of the claims bank stockholders obtained was significantly greater than their previously held claims on the bank.² In fact, the ratio at which the holding company stock was exchanged for that of the bank was so favorable to the bank's shareholders that a careful examination of possible earnings differentials between the firms was not necessary. The market values of the stocks have been an adequate (albeit imperfect) gauge of this differential. A much closer look, however, is necessary when trying to explain why BHCs have been willing to pay such premiums.

Piper's original study and his later work with Weiss shifted emphasis from the *valuation* of the stocks traded in the acquisition to the *profitability* of acquisitions to the stockholders of the parent holding company. Each study concluded that, due to the high premiums paid for bank stock, acquisitions have failed to improve the earnings of the holding companies. The shift from valuation to profitability, however, begs questions concerning the manner in which owners value a given income stream.

A valuation framework that includes a constant discount rate, adjusted for expectations of risk, rules out any possibility that the manner in which

¹ Piper's analysis of bank acquisitions [3] and his subsequent work with Weiss [4] clearly recognized that an alteration in ownership positions resulted from acquisitions. Their consideration of this point was an important shift from concentration on bank performance alone.

² Piper's results showed that the market value of BHC stock received exceeded the book value of the bank by 30%. In his later study with Weiss, comparing the claims on holding company earnings received by former stockholders of the acquired bank relative to earnings of the bank stock, the median premium was found to be 16%.

*The author would like to acknowledge the assistance of Robert Strand with the data processing involved in this article.

earnings are valued may change in response to the operating policies and earnings performance of the firm. While such an assumption greatly simplifies the analysis, it ignores a potentially important source of the valuation disparity underlying the incentives for the acquisition of commercial banks by BHCs: i.e., changes in owners' discount rates due to their evaluation of risk.³

Valuation via a Risk-Adjusted Discount Rate

The most widely used model for valuing risky, multi-period earnings streams is the risk-adjusted discount rate. Through this technique, a measure of the magnitude of the earnings flow, usually expected value, is evaluated by a discount rate that takes into account the rate of time preference and some measure of the degree of riskiness associated with an earnings flow. Individuals must make estimates of future earnings and apply a subjectively determined discount rate to them.

Since this approach is not based on any specific assumption as to what constitutes the risk associated with expected earnings, it has serious shortcomings. Unless a specific, dynamic measure of risk is incorporated within the framework, the detection of differences in valuation due to differences in risk is not possible. In order to measure the effect on valuation of an acquisition, knowledge of the pre-acquisition capitalization rate and the response of that rate to the acquisition is required. It is entirely possible that the addition of another income stream with a different discount rate may alter owners' capitalization rates in subsequent periods.

A specific present value of earnings cannot, however, be derived without information concerning owners' attitudes toward risk and the trade-off they are willing to make between risk and return. This becomes a serious stumbling block in the search for the motivation for acquisition, but it need not be insurmountable. There are two distinct sets of investors involved in any acquisition: the independent bank shareholders and those of the BHC. Each group obtains a claim on an earnings stream that is somewhat altered from its previous holdings. The acquisition is beneficial if the capitalized value of the transformed earnings stream is greater than that the stockholders perceive would have been available through holding on to their existing claims. A change in this valuation through a shift in capitalization rates, then, could result from either a shift in

the investors' measure of risk following the acquisition or the manner in which a given change in risk affects the capitalization rate. Since the individuals making the valuation comparisons have not changed, it seems reasonable to assume, for simplicity, that the exact *form* of the capitalization rate function in terms of risk does not change.⁴ As long as an increase (decrease) in the measure of risk faced by owners is reflected in an increase (decrease) in the discount factor used to evaluate an earnings stream, emphasis may be placed on the expected behavior of risk under alternative situations. If it is assumed that a detected difference in the measure of risk results in different capitalization rates, valuation disparities may be sought by comparing alternative earnings performances and *measures* of risk.

The Basis for Acquisition The suggested approach for analysis of the economic basis for acquisition is founded upon the premise that the firm that engages in banking determines its operating and organizational structure on the basis of optimization of the economic value of the ownership of the firm, i.e., the owners' wealth position. Owners' wealth is perceived as the capitalized value of the expected future earnings stream. Since the objective to be maximized is in value terms, specific attention must be given to its components. In general terms, $V = \pi/\rho$, where V , π , and ρ represent, respectively, value, profit, and the owners' capitalization rate (which is adjusted for considerations of time preference and risk).

The essential consideration of the analysis for bank owners is the difference in the valuation of their ownership position if they (a) continue their present structure of organization and production as opposed to (b) trading their bank stock for partial interest in a holding company. For BHC owners, it is the difference in the valuation of their ownership claims perceived through (a) the present BHC structure and (b) the expanded organization created through acquisition. The first disparity provides an incentive for the present bank owners to make the transaction, while the second provides the incentive for holding company acquisition activity. The purchase price of the bank stock, usually in terms of a stock-exchange ratio, is then determined by the relative bargaining power of the buyer and sellers and the degree of competition in the buying and selling of bank equity.

³ If owners are concerned with more than just the mean level of earnings, and a measure of risk does affect their discount factor(s), a reduction in the risk associated with a given earnings distribution will reduce the discount factor if owners are risk averse and result in a higher valuation of those earnings. Comparison of earnings means alone will not detect this disparity.

⁴ For a discussion of the dependence of the form of an individual's capitalization rate function in the presence of uncertainty on the form of his underlying utility function, see Douglas Vickers, Chapters 2 and 4. Vickers suggests that the capitalization rate function is nonlinear in the coefficient of variation of net income and concave upward.

Regardless of the measure of risk utilized, acceptance of the proposition that owners' conceptions of risk may change over time and may be altered by specific actions of the firm has important implications for the risk-adjusted discount rate and may significantly alter valuation of the earnings accruing to owners. The provision of a dynamic capitalization rate (ρ), which is a function of the risk associated with a given earnings stream, provides a valuation framework that considers *both* the earnings experience and the behavior of the discounting function used by owners in evaluating their ownership position. In present value terms,

$$(1) \quad V = \sum_{t=1}^H \frac{\pi_t}{\rho_t}$$

where V is the present value of the future earnings stream to owners, π_t is net earnings on owners' equity in period t , ρ_t is the owners' capitalization rate⁵ applied to earnings in period t , and H is the economic horizon of ownership in the firm. In this framework, valuation disparities may be sought for both sets of participants in the transaction—the bank stockholder and the shareholder of the BHC.

Bank owners will have an incentive to trade their stock only if a valuation disparity is established between the capitalized value of the stream of bank profits accruing to owners through continued ownership in the bank and that realizable from gaining an ownership interest in the holding company. Specifically, they have an incentive to trade their stock for that of a holding company only if:

$$(2) \quad V_B = \sum_{t=1}^H (\pi_t/\rho_t)_B < \alpha \sum_{t=1}^H (\pi_t/\rho_t)_{HC} = \alpha V_{HC}$$

where V_B is the ownership valuation of the bank, α is the share in the total ownership of the holding company obtainable by bank owners, and V_{HC} is the total ownership valuation of the BHC. The bank owners' valuation of their portion of holding company earnings will, in this case, be greater than their valuation of expected bank earnings. Previous findings, in terms of this framework, suggest that α has been large enough to assure the necessary disparity in valuation of earnings.

⁵ The owners' discount rate in period t (ρ_t) may be further specified: $\rho_t = (1+r_1)(1+r_2) \dots (1+r_{t-1})(1+r_t)$, where r_t is dependent on the owners' time preference pattern i (assumed constant) and an appropriate measure of risk, e.g., the coefficient of variation of net income (V_n), which is the standard deviation of the probability distribution of expected net incomes divided by the mean of the probability distribution function. ρ , then, may also be expressed as functionally dependent on these same variables: $\rho = \rho(i, V_n)$.

Similarly, an incentive for holding company acquisitions exists on the demand side for bank stock only if present company stockholders view a similar valuation disparity. In particular, only if the acquisition of a commercial bank improves the capitalized value of owners' earnings over that perceived without acquisition will present owners move to acquire the bank; i.e., only if:

$$(3) \quad (V_{HC})_{\sim B} = \sum_{t=1}^H (\pi_t/\rho_t)_{\sim B} < \beta \sum_{t=1}^H (\pi_t/\rho_t)_B = \beta (V_{HC})_B$$

where $(V_{HC})_{\sim B}$ is the ownership valuation of the holding company without acquiring the bank, β is the proportion of ownership interest in the company retained by present owners ($\beta = 1-\alpha$), and $(V_{HC})_B$ is the capitalized value of the earnings stream of the holding company including the proposed acquired bank. Even though their percentage ownership (β) falls with an acquisition, present owners may still benefit if earnings increase significantly *or if risk*, and, therefore, the vector of owners' capitalization rates following acquisition is *reduced*.

For an acquisition to occur, then, both valuation disparities must exist. The present owners of an independent bank and of a holding company will agree to participate in an exchange of stock if each group perceives a positive shift in its ownership valuation resulting from the transaction. Equations (2) and (3) represent the conditions necessary for consummation of an acquisition agreement. Of particular interest is the fact that nowhere in (3) is there any implication that the bank's profitability must be increased following acquisition. If the owners are assumed to maximize the value of their ownership position, they will be concerned with the valuation of their share of the holding company rather than that of a single subsidiary. It may be that factors such as the structure of organization, production considerations, and costs that optimize the economic valuation of the consolidated company's earnings stream conflict with the attainment of the maximization of one of its subsidiaries' returns. Such an hypothesis is consistent with empirical results heretofore obtained that suggest that bank profitability is not significantly enhanced through holding company affiliation.

In fact, if it is recognized that the acquisition of a bank may have a positive impact on the level and/or stability of earnings of other subsidiaries within a BHC organization, consideration of changes in bank profitability is an inadequate tool with which to ex-

amine the economic basis for acquisition. It is essential that the analysis consider both the earnings experience and associated expectations of risk of each ownership position. An examination of both levels of alternative earnings and the manner in which those earnings are valued is necessary before conclusions may be reached.

Empirical Investigation The argument presented to this point suggests that a valuation framework, by taking expectations of future earnings and a measure of risk associated with the pattern of future earnings into account, can explain the economic motivation of both independent bank owners and BHC shareholders to negotiate an acquisition. The remainder of this article investigates the gains accruing to holding company shareholders through acquisition.

A BHC's acquisition of a commercial bank involves the dilution of its present ownership in an attempt to increase the present value of the ownership retained. This result is assured if the original BHC owners believe that following the acquisition their earnings will be greater, with equivalent or reduced risk, than they would be without acquisition. This

result could also occur, however, through a reduction in owners' risk with equivalent or improved future earnings. Any motivation for acquisition arising from the combination of reduced earnings and reduced risk or increased earnings and increased risk following acquisition is entirely dependent on trade-offs between risk and return within individual preference functions. Since such information is not known, substantiation of our hypothesis must rest on those cases where movements in risk and return do not have conflicting effects on valuation.

The tendency in recent experience for multi-bank holding companies to acquire numerous commercial banks, and at relatively short intervals, seriously complicates the empirical task of isolating the impact of individual bank acquisitions on BHC earnings performance. The only feasible empirical test has to involve the entire acquisition program of the holding company and concerns itself with whether or not the policy of expansion through acquisition improves the value of earnings accruing to owners.

Benefits of acquisition may be explored by a direct comparison of the trends in the earnings experienced

Table I

**EARNINGS PERFORMANCES THROUGH BHC AND CONTINUED OWNERSHIP
IN LEAD BANK FOLLOWING REORGANIZATION AND ACQUISITION**

Avg. Annual Net Income of Lead Bank that Would Have Accrued to Original Owners of Lead Bank	Avg. Annual Net Income of BHC Accruing to Original Owners of Lead Bank	Difference (BHC-Lead Bank)	Average Growth Rate in Net Income of Lead Bank	Average Growth Rate in Net Income Through BHC	Average Difference (BHC-Lead Bank)
\$1,078,111	\$1,305,487	\$ 227,376	12.55%	16.02%	3.46%
2,305,407	2,702,661	397,254	13.63	12.57	-1.06
5,071,545	5,147,484	75,939	9.13	10.10	0.97
1,679,674	1,862,217	182,543	13.92	18.63	4.71
1,632,975	2,185,064	552,089	17.15	27.13	9.97
2,022,951	1,918,527	-104,424	17.36	18.84	1.48
1,506,681	1,778,686	272,005	8.00	14.64	6.64
1,455,996	1,455,526	-470	21.65	22.00	0.35
2,369,669	2,635,102	265,433	4.18	10.82	6.64
7,676,530	8,849,941	1,173,411	9.22	13.28	4.07
3,722,490	3,809,746	87,256	8.11	10.59	2.48
6,955,577	6,650,758	-304,819	10.99	9.40	-1.60
5,382,316	4,999,337	-382,979	13.58	11.56	-2.02
3,155,189	3,528,637	373,448	16.92	22.98	6.07
4,815,430	4,726,720	-88,710	7.93	6.90	-1.02
2,300,507	2,103,128	-197,379	35.11	30.83	-4.28
3,387,176	5,972,261	2,585,085	-4.82	6.35	11.17
1,775,490	2,620,029	844,539	2.36	16.34	13.98
Mean \$3,238,536	\$3,569,512	\$ 330,978	12.05%	15.50%	3.45%*
(568,712.187)	(698,058.187)		(19.954346)	(16.037262)	[“t” = 1.345]

*Significant at the .20 level.

Note: Standard deviations in parentheses.

Sources: Moody's Bank and Finance Manual and internal records of seven Federal Reserve Banks.

over the post-acquisition period under the alternative ownership positions. The appropriate comparison involves the values of earnings accruing to those owners holding stock in a BHC at the time of acquisition—for they are the individuals contemplating the transaction. A major problem with this approach is that data that would reveal the earnings of a holding company had the acquisition not taken place are not available.

Fortunately, however, this technique is applicable to one group of acquisitions within the last decade. Many of the acquisitions in the late 1960's were facilitated by the simple reorganization of an independent bank into another corporate form that was permitted to acquire additional banks. This was especially prevalent in states where mergers and/or branching were prohibited or limited by state law. The corporate transformation often involved nothing more than the exchange of new BHC stock for the stock of an existing bank. At the same time, additional BHC shares were issued in exchange for the stock of one or more additional banks. In other words, the lead bank owners frequently traded 100% ownership in the bank for less than total ownership in an expanded banking organization. Comparison of the earnings trend of that specific set of owners following reorganization with what they would have realized had they retained their independent ownership in the bank provides a measure of the potential benefits to owners via acquisition through a BHC organization.

Such a comparison is possible making use of previous empirical results that have shown commercial bank profitability to be relatively unaffected by acquisition.⁶ This comparison was chosen because it provides the only appropriate data available that examine the incentives for acquisition. Reports of Income exist for the years following acquisition for the holding company on a consolidated basis and for the lead bank separately. These provide the basis for the direct comparisons of owners' valuation. There are no comparable data available that reveal the earnings performance of a multi-bank holding company excluding any particular acquired bank. Benefits accruing to original owners of these lead banks through reorganization and acquisition, then, may be used as a subsample to shed light on the economic incentives present in the larger population of BHC acquisitions. If bank earnings are not affected by acquisition, the appropriate comparison to be made is between the trends of the ownership valuations of (a) the original bank owners' equity interest in the bank and (b) the

⁶ The reader is referred to Fischer, Lawrence, Piper, Talley, and Ware for a good sample of this literature.

Table II
COEFFICIENTS OF VARIATION OF GROWTH RATES
OF NET INCOME THROUGH BHC AND LEAD BANK
FOLLOWING ACQUISITION

	Coefficient of Variation of Income Growth Rates For Lead Bank	Coefficient of Variation of Income Growth Rates Through BHC	Difference (BHC-Lead Bank)
	1.071895	0.594423	-0.477472
	2.645937	1.851482	-0.794455
	1.242849	1.181919	-0.060930
	1.130456	0.234433	-0.896023
	1.007689	1.402617	0.394928
	1.248705	1.160084	-0.088621
	2.543271	1.520361	-1.022910
	1.649359	1.323782	-0.325577
	4.325461	0.560705	-3.764756
	3.987330	0.941209	-3.046121
	1.770638	2.029515	0.258878
	0.605394	0.795784	0.190390
	1.570596	1.168754	-0.401842
	1.196462	0.772820	-0.423642
	1.877712	2.031342	0.153629
	0.729631	0.571625	-0.158007
	4.253756	1.354321	-2.899434
	3.889851	0.564985	-3.324865
Mean	2.041496 (1.260457)	1.114450 (0.530057)	-0.927045* ["t"=3.026]

*Significant at the .05 level.

Note: Standard deviations in parentheses.

Sources: See Table I.

interest obtained by that same group of owners in the expanded BHC organization through an exchange of stock.

This comparison, requiring complete knowledge of stock splits, dividends, and dilution of owners' percentage share of total earnings, began the year immediately preceding the acquisition and continued for at least five years after the time of acquisition.⁷ The sample was restricted to those reorganizations occurring between 1962 and 1969, with all but three occurring since 1966. The average levels of earnings, average growth rates in earnings, and coefficients of variation of levels and growth rates of earnings (as measures of owners' risk) were computed over the period for both of the ownership alternatives. These sample data permit mean difference tests to be performed on the arguments of the valuation function.

⁷ The sample consisted of 18 BHCs and associated lead banks located in seven Federal Reserve Districts with data available for at least five years after reorganization. The lead banks, all members of the Federal Reserve System, ranged in deposit size from approximately \$100 million to \$650 million at the time of reorganization. The necessary information was available for the sixth year for seven of these holding companies and banks and was incorporated into the analysis. Earnings accruing to original owners were computed by multiplying total net income of the firm by their percentage ownership in the firm for each year.

Table III

EARNINGS THROUGH BHC AND LEAD BANK BY INDIVIDUAL YEAR

	Years Following Reorganization and Acquisition					
	1 year	2 years	3 years	4 years	5 years	6 years
Owners' Net Income Through BHC	\$2,659,982	\$3,189,644	\$3,529,352	\$3,936,692	\$4,138,920	\$5,004,592
Owners' Net Income Through Lead Bank	2,867,316	3,009,613	3,268,524	3,520,821	3,545,288	3,247,005
Difference (BHC-Bank)	-207,334	180,031	260,829	416,144	593,632	1,757,589
Growth Rate of Net Income Through BHC	21.49% (17.635)	25.07% (23.100)	9.27% (12.966)	16.37% (16.855)	6.11% (9.427)	12.01% (11.622)
Growth Rate of Net Income Through Lead Bank	26.08% (25.869)	11.47% (16.958)	10.92% (16.048)	14.43% (24.288)	0.93% (14.228)	-0.86% (20.027)
Difference (BHC-Bank)	-4.59%	13.50%* ["t"=1.999]	-1.65%	1.94%	5.18%	12.87%** ["t"=2.358]

*Significant at the .10 level.

**Significant at the .05 level.

Notes: Standard deviations in parentheses.

Sixth year data based on seven BHCs and associated lead banks. Other years based on sample size of 18.

Sources: See Table I.

Table I shows that the mean difference in average annual earnings over the entire post-acquisition period was substantial. Previous owners of the lead banks realized an average improvement of \$330,978 per year through the reorganization. This sum was not statistically significant, however, due largely to the considerable variance within sizes of firms included in the sample. The growth rates in net income did display a significant difference, though only at the .20 level. Specifically, the growth rate in earnings through the BHC was an average of 3.45% greater per year than would have been the case had the owners maintained their interest in the bank alone. Growth rates may be especially revealing since they, at least partially, compensate for size discrepancies within the sample. At the same time there was no significant difference between coefficients of variation of net income over the entire period. The coefficients of variation of growth rates of income, however, exhibited a significant difference at the .05 level over the interval. Specifically, this measure of risk was *substantially reduced* through the acquisition program, as reflected in Table II.

A comparison of earnings experience over time, shown in Table III, indicates that holding company owners actually experienced reduced earnings through reorganization and acquisition in the first year relative to the experience of the bank alone. This first-year reduction in earnings appears attributable to the large premiums paid for bank stock. Each year thereafter, however, earnings are progres-

sively larger under the BHC structure. This trend is also reflected in the difference in growth rates of earnings.⁸ In general, therefore, it appears that earnings for the BHC not only increased faster on an absolute basis when compared to the bank but also on a percentage basis, indicating that the difference between the two increases over time.

If owners are aware of this trend, they may willingly accept losses in the first year after acquisition in order to receive claims on increasingly improved earnings in later years. If primary interest is placed on later years by omitting the first year's results from the analysis, the inference is altered somewhat. The average annual difference in net income increases to \$444,784, while the difference in coefficients of variation of net income remains slightly negative. These differences are still not significant, however. The difference in average income growth rates increases to 5.27%, significant now at the .10 level, while the difference in coefficients of variation of income growth rates widened, i.e., became more negative. This difference remained significant at the .05 level.

Summary and Conclusions Trends are established within the first few years following acquisition, therefore, that improve the present value of earnings flowing to owners relative to that attainable without

⁸ If BHC earnings are depressed in the immediate post-acquisition period, the experience of the third and fourth years following reorganization are not surprising, since most of the BHCs in the sample made additional acquisitions in those years.

reorganization. Owners have experienced improvements in the level of earnings to which they hold claims and, apparently, this improvement grows over time. In addition, to the extent that the owners' conception of risk is accurately measured by the coefficient of variation of income growth rates, risk is reduced through the acquisition program. If, as assumed, this is reflected in lower capitalization rates associated with the expanded banking organization, a basis for disparity in both the numerator and denominator of the valuation framework ($V = \pi/\rho$) is present.

These results become even more meaningful when it is realized that earnings streams attained through a BHC structure may be somewhat depressed by subsequent acquisitions during the period of analysis. This tendency would decrease the difference in earnings performance when comparisons are made over a short post-acquisition interval and with firms that acquired other institutions after the time of the original acquisition.

A note of caution should be injected, however. The sample used represents a special class and a very small proportion of the total population of acquisitions taking place. Whether or not measuring benefits to lead bank owners who formed holding companies to acquire other firms is representative of the benefits accruing to stockholders of established

BHCs through acquisition may be questioned. It does, however, provide a rational explanation for the formation of many BHCs that is consistent with the theory of wealth maximization.

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