Corporate Mergers And the Business Cycle

By Sean Becketti

Corporate mergers have increased markedly in recent years. The number of mergers nearly doubled over the last five years, increasing from 1,526 acquisitions in 1979 to 2,999 in 1984. The real dollar value of mergers nearly tripled, increasing from $85.1 billion (1982 dollars) in 1979 to $242.1 billion in 1984.[1] In 1984 alone, there were 14 mergers with market values of more than a billion dollars each. One merger, Chevron's acquisition of Gulf in 1984, had a price tag of $13.3 billion, nearly twice the value of any previous merger.

The recent period of merger increase is not unique, however. There have been at least three previous waves of mergers in modern U.S. industrial history: the creation of large trusts in the 1890s, the formation of oligopolies in the late 1920s, and the rash of conglomerate mergers in the 1960s. The apparently periodic nature of merger waves has led to two approaches to the study of merger activity. Some economists view merger waves as unique episodes that can be attributed to particular changes in the law or in government regulations. According to this view, events such as the Department of Justice's relaxation of antitrust enforcement in 1982 and 1984 help explain the recent merger boom.[2]

Other economists focus on the procyclical nature of merger activity, the tendency for mergers to increase rapidly as the economy expands and to slow as the economy contracts. According to this view, fluctuations in such macroeconomic variables as interest rates and stock prices may help explain fluctuations in

[1] These figures are from the database compiled by *Mergers and Acquisitions* magazine.

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[2] This argument is advanced in the *Economic Report of the President*, Council of Economic Advisers, U.S. Government Printing Office, 1985, Chapter 6.

merger activity.[3] More recently, there has been increased interest in the possible effect of merger activity on the macroeconomy. Concerns have been raised about the possibly detrimental effects of merger activity on credit markets and the behavior of the monetary aggregates.[4]

This article examines the relationship between corporate merger activity and the business cycle. The analysis focuses on two issues. First, to what extent can merger activity be explained by such macroeconomic variables as interest rates, output, and stock prices? Second, do mergers appear to have systematic effects on real and financial variables? Specifically, do mergers have detrimental effects on the macroeconomy?

The next section examines the nature of mergers, discusses how mergers are financed, and places the current merger wave in historical perspective. The second section reviews some hypotheses about potential relationships between mergers and the business cycle. The third section tests these hypotheses by using data for the last 25 years of merger activity. The hypotheses are then assessed in light of the empirical results.

Mergers in perspective

The nature of mergers and the magnitude of merger activity have changed considerably over the past century. This section examines the evolution of the form of merger activity and compares the current increase in mergers with previous merger waves.

The nature of mergers

There are several kinds of mergers. A consolidation is the combination of many firms into a single new firm. This type of merger was typical of the merger wave of the 1890s. One of the best-known examples of a consolidation was the combining in 1901 of an estimated 785 firms into the United States Steel Corporation, the first U.S. industrial corporation with a capitalization of more than a billion dollars. As a result of antitrust legislation and associated court rulings, consolidations have virtually disappeared. They have been replaced by acquisitions of one corporation by another or by a group of investors.

Do mergers have detrimental effects on the macroeconomy?

Economists distinguish between horizontal, vertical, and conglomerate mergers. A horizontal merger is a union of firms selling the same product—that is, a combination of previously competing corporations. Horizontal mergers draw the most attention from regulatory agencies because they directly reduce the number of competitors. A vertical merger joins a supplier and one of its customers. An example is the purchase of a steel company by an automaker. A conglomerate merger is a combination that does not fit into either of the other two categories. The simplest type of conglomerate merger is one that combines completely unrelated firms. The purchase of the Otis Elevator Company by United Aircraft was an example of a pure conglomerate merger.

Mergers are financed in various ways. Sometimes the acquiring and target firms sim-

[3] For examples of this view, see Ralph L. Nelson, *Merger Movements in American Industry, 1895-1956*, Princeton University Press, 1959; Ralph L. Nelson, "Business Cycle Factors in the Choice Between Internal and External Growth," *The Corporate Merger*, eds., William W. Alberts and Joel E. Segall, University of Chicago Press, 1966; and Ronald W. Melicher, Johannes Ledolter, and Louis J. D'Antonio, "A Time Series Analysis of Aggregate Merger Activity," *The Review of Economics and Statistics*, Vol. 65, no. 3, August 1983, pp. 423-430.

[4] See, for example, *The Sommers Letter*, September 19, 1985.

ply swap shares at a mutually agreed-on price. Most target firms receive a combination of cash, debt, and equity in the acquiring firm. The simplest and most effective way of acquiring a firm is to offer to pay cash for all outstanding shares. This approach has been popular in recent years, even for very large acquisitions, in the form of the *leveraged buyout*. In this type of deal, a group of investors, often the managers of the target firm, borrow almost all of the cash needed to purchase the target firm. Below-investment grade bonds, so-called "junk bonds," are often used to finance leveraged buyouts. This mechanism has opened the merger market to a broader range of participants and weakened the defenses of target firms that want to stay independent.

Previous merger waves

The first two U.S. merger waves were composed largely of horizontal mergers. The wave of the 1890s was characterized by mergers that often openly sought to create monopolies. The Sherman Act of 1890 was intended to outlaw this behavior. It was not until the Supreme Court ruled in favor of the government, however, in the 1904 *U.S. vs. Northern Securities Company* case that mergers were eliminated as a means of evading the law.[5] Accordingly, the horizontal mergers of the 1920s produced oligopolies—that is, firms that claimed a significant share of the market but less than an outright monopoly.

The passage of the Celler-Kefauver Act of 1950 further discouraged horizontal and vertical mergers. As a result, most of the mergers since World War II have been conglomerate mergers. It has been estimated that where 50.4 percent of the mergers during the 1948-53 period were conglomerate mergers, the proportion in 1973-77 was 79.1 percent.[6]

The recent merger boom

The 1980s have seen the revival of the horizontal merger. The four largest mergers in 1984, with a total value of $33.6 billion, were acquisitions of oil companies by other oil companies. Mergers of airline companies and media companies also have become prevalent. Specific decisions by the Federal Trade Commission (FTC) and a general movement toward deregulation appear to be responsible for this trend.

The most notable feature of the recent boom has been the increase in the number of mergers involving very large firms. Table 1 documents this increase. The average value of a merger transaction—the average value of all the assets paid for an acquired firm—rose from $56 million (1982 dollars) in 1979 to $81 million in 1984. Evidence of this increase in the size of the average merger also appears in the ratio of the dollar value of all mergers to the dollar value of common and preferred stock of all publicly traded domestic firms. This ratio climbed from less than 2 percent in 1975 to almost 8 percent in 1984, a level that exceeds the 1969 value.[7]

The number of firms involved in mergers has not increased as rapidly as the value of the assets exchanged in mergers. Even though the

[5] The key statutes affecting the first two merger waves were the Sherman Act of 1890, which prohibited monopolization, attempts to monopolize, and actions in restraint of trade; the Clayton Act of 1914, which extended and modified the Sherman Act; and the Federal Trade Commission Act of 1914, which, among other things, established the Federal Trade Commission.

[6] These figures are taken from F. M. Scherer, *Industrial Market Structure and Economic Performance*, Rand McNally College Publishing Company, 1980, p. 124.

[7] These figures are reported in Mack Ott and G. J. Santoni, "Mergers and Takeovers—The Value of Predator's Information," *Review*, Federal Reserve Bank of St. Louis, Vol. 67, no. 10, December 1985, p. 18.

TABLE 1
Mergers and acquisitions of U.S. corporations

Year	Number	Total Value* (millions of 1982 dollars)	Average Value* (millions of 1982 dollars)
1979	1,526	85,103	56
1980	1,568	89,153	57
1981	2,326	137,062	59
1982	2,295	125,394	55
1983	2,344	114,504	49
1984	2,999	242,135	81
1985†	2,291	165,842	72

* The value of a merger is the value of all consideration paid for the acquired interest.
† First three quarters.

Source: These figures are taken from the database compiled by *Mergers and Acquisitions* magazine. They include purchases of U.S. corporations by other U.S. companies and by foreign companies where the total value of cash, capital stock, and debt paid for the acquired company is at least $1 million. Partial acquisitions of 5 percent or more of a company's capital stock are included. The total value is the value of those transactions for which a value was recorded adjusted for the percentage of transactions where no value was recorded. In these data, a value was recorded for between 40 and 60 percent of the mergers in each period. The average fraction of deals with known values was 48 percent.

number of mergers nearly doubled between 1979 and 1984, the 2,999 mergers in 1984 still fell short of the postwar peak of 3,012 mergers reached in 1969. Also, the rate of merger has remained fairly constant since the mid-1970s at slightly less than ten mergers per 10,000 firms—a rate far below the 1969 peak rate of 25 mergers per 10,000 firms.[8]

Mergers and the macroeconomy

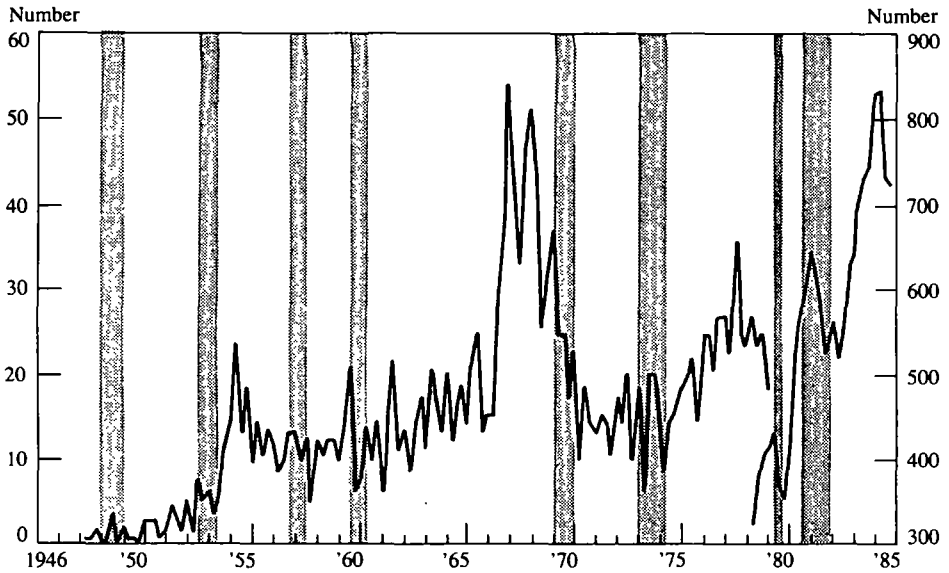
A casual examination of the past 40 years of mergers reveals that merger activity is strongly related to the business cycle. Chart 1 illustrates this phenomenon by using two different measures of the number of mergers. The data for the 1948-79 period come from the FTC's tabulation of mergers of large mining and manufacturing firms. The data for the 1979-85 period come from a database compiled by *Mergers and Acquisitions* magazine. The time period is separated into expansion and recession phases of the business cycle with the shaded regions indicating recessions.

Chart 1 reveals two important features. First, the number of mergers appears to be procyclical. Mergers typically increase during expansions and decrease during recessions. Second, the increase in merger activity appears to reach its peak before the peak of the business cycle expansion; that is, merger activity begins to decline before GNP reaches its peak. Note particularly the early peak in the number of mergers during the expansion in the mid-1950s, during the long expansion in the 1960s, and during the 1975-80 expansion.

A more detailed look at the data helps quantify the different behavior of mergers over the business cycle. In the period from 1948 to

[8] See Ott and Santoni, "Mergers and Takeovers. . . ."

CHART 1
Mergers and acquisitions of U.S. corporations
(By quarters)



Note: The data for the years 1948-79, measured on the left scale, come from the Federal Trade Commission's tabulation of mergers of large mining and manufacturing firms reported in the FTC's *Statistical Report on Mergers and Acquisitions* for various years. The data for the years 1979-85, measured on the right scale, come from the database compiled by *Mergers and Acquisitions* magazine. This database includes many more mergers than are reported in the FTC's counts. Shaded areas indicate periods of recession.

1979, the number of mergers increased at an average annual rate of 6.9 percent.[9] This growth rate rose to 10.6 percent during expansions and fell to 6.1 percent during recessions. The real-dollar value of mergers grew at an average annual rate of 13.2 percent over the entire 1948-79 period. The rate of growth of the dollar value rose to 15.6 percent during expansions, while the dollar value declined at a rate of 13.0 percent during recessions.

This association between mergers and the business cycle also is evident in the current merger boom. The average annual rate of growth in the number of mergers from 1979 to 1985 was 12.6 percent. The number of mergers increased 18.0 percent a year during expansions and declined 18.1 percent a year during recessions. The real-dollar value of mergers grew at an annual rate of 18.0 percent for the entire period. The dollar value grew at a rate of 42.5 percent during expansions and fell at a rate of 16.7 percent during recessions.

Observers have advanced several explanations for the procyclical behavior of mergers. Some have focused on the linkages running

[9] The growth rates for 1948 through 1979 are calculated from the data series on large mergers in mining and manufacturing reported in the Federal Trade Commission, *Statistical Report on Mergers and Acquisitions*, various years. The growth rates for 1979 through 1985 are calculated from the data in the database compiled by *Mergers and Acquisitions* magazine.

from financial markets and real activity to the behavior of mergers. In this view, the procyclical movement in merger activity is largely a reflection of the underlying business cycle. There is considerable uncertainty, however, about which cyclical factors have the strongest influence on mergers. More recently, other observers have asked whether there might be important linkages running in the opposite direction—from mergers to real and financial activity. Thus, some have raised concerns over the possible detrimental effects of mergers on the economy.

A casual examination of the past 40 years of mergers reveals that merger activity is strongly related to the business cycle.

The remainder of this section summarizes some of the principal hypotheses concerning the linkages between mergers and the business cycle. None of these hypotheses has so far achieved the status of a generally accepted theory, and the theoretical justifications for these hypotheses vary greatly. For convenience of exposition, these explanations are grouped into two categories: linkages between mergers and financial markets and linkages between mergers and real activity.

Mergers and financial markets

Events in financial markets may influence merger activity either by changing the profitability of mergers or by changing the stock of liquid assets available for mergers. Movements in interest rates and stock prices fall into the first category; they change the profitability of mergers. Fluctuations in the stock of money and the stock of debt, on the other hand, directly affect the pool of funds on which merger demand can draw.

Changes in interest rates may affect the profitability of mergers. A significant number of corporate acquisitions are financed either wholly or partially with debt. As interest rates change, the cost of funds used in acquiring firms changes. Also, bond purchases are an alternative use for the cash that might be slated for corporate purchases. As a consequence, it might be expected that fluctuations in interest rates are related to fluctuations in merger activity. In particular, merger activity could be expected to decline as interest rates rise.

It is natural to consider the possibility of a link between conditions in the stock market and merger activity.[10] The primary reason for purchasing a company instead of merely holding some of its stock is the belief that the firm would be worth more managed by a new team or integrated into a larger concern. If, for some reason, the number of firms that are "undervalued" in this sense increases, the number of mergers will increase.[11]

The direction of the observed effect of stock price changes on merger activity depends on the time it takes to complete a merger. The decision to acquire a firm may be made when the target firm's stock price first dips below its presumed value after reorganization. If the merger is consummated rapidly, then the historical record will show an inverse relationship between stock prices and mergers; that is, decreases in stock prices will precede increases in merger activity. If, as seems more likely, merger negotiations take substantial

[10] Links between the stock market and the volume of merger activity are considered in Nelson, *Merger Movements in American Industry, 1895-1956*, 1959 and "Business Cycle Factors in the Choice...," 1966, and in Melicher, Ledolter, and D'Antonio, "A Time Series Analysis...," 1983.

[11] Some observers also have argued that institutional changes in capital markets were necessary preconditions for particular merger booms, especially for the first two merger booms.

time and if, during that time, speculators bid up the price of the target firm on the basis of the expected merger, then a positive relationship between stock prices and mergers will be seen. Increases in stock prices will precede increases in merger activity.

Changes in the stock of money and debt may affect the volume of merger activity indirectly through their effect on interest rates. Changes in these monetary aggregates also may induce changes in the general availability of credit. Thus, to the extent that mergers are sensitive to credit availability, changes in monetary aggregates may have an effect on mergers independent of their influence on interest rates.

It has been conjectured that fluctuations in merger activity may also influence conditions in financial markets. Stock prices, for example, may react to changes in the number of mergers. First, changes in ownership may drive prices up by heralding more profitable operations in the future. Second, a rash of mergers may convince investors that more mergers are coming and thus may persuade them to buy shares in the hope of being bought out later at a premium price. Third, to the extent that mergers are financed with cash and debt, the supply of shares may temporarily decline. This reduction in supply may lead to a general, though temporary, increase in the price of shares as investors try to replace them in their portfolios.

Some observers have worried that the merger-fueled demand for credit might drive up interest rates and discourage borrowing for other kinds of investment. There appears to be little theoretical basis for this concern. After all, the original shareholders will reinvest the borrowed funds that are used to buy them out. In addition, merger-related borrowing has never been a large part of all borrowing. In any event, if the purchase and restructuring of firms increases profits enough to cover the cost of the borrowed funds, it is economically efficient to divert funds to mergers and away from less profitable investments.

A few observers have suggested that the merger-driven demand for funds has upset the normal relationship between the stock of money and other economic variables. Albert Sommers, the former chief economist of the Conference Board, has speculated that the recent poor performance of traditional models of money demand may be partly due to the financing of the current merger boom.[12]

Mergers and real activity

From the point of view of the acquiring firm, a merger has many of the same characteristics as an investment in new plant and equipment. As a result, merger activity, like other forms of investment, should increase when aggregate demand is expected to increase. Current shifts in real activity often signal future shifts in aggregate demand. Therefore, it is reasonable to suspect that changes in real activity may also signal changes in the volume of mergers. Because the important factor here is the market's expectation of future demand, the precise timing between changes in real activity and changes in mergers is difficult to predict.

An important difference between a merger and a purchase of new plant and equipment is that a firm's output is expanded more rapidly with a merger than with traditional investment expenditures. This difference in the rate at which output can be expanded is greatest when the economy is producing near its capacity and the lags between the order and the delivery of new plant and equipment are long. This difference suggests that merger activity

[12] See, for example, *The Sommers Letter*, September 19, 1985.

may move differently from investment expenditures when firms, on average, expect higher demand in the future and when the capacity utilization rate also is high.

Many analysts believe that mergers allow the assets of acquired firms to be directed toward more profitable activities. If this is so, a general increase in the number of mergers should lead to an increase in aggregate productivity and thus to an increase in aggregate output. Of course, the reorganization of an acquired firm takes time, so any increase in output will occur only after some time.

A statistical analysis of aggregate merger activity

This section analyzes the statistical relationship between merger activity and a set of macroeconomic variables to assess the explanations for the tendency of mergers to be procyclical. First, the evidence from previous research is reviewed. Then, a method of modeling mergers is discussed. And finally, the results of analyzing this merger model are presented.

Previous work on mergers and macroeconomic activity

The academic literature on mergers contains a few scattered results on the relationship between merger activity and the business cycle. Ralph Nelson considers mergers to be just another form of investment available to the acquiring firm.[13] He compares the "external" investment of a merger to the more familiar "internal" investment in additional plant and equipment. He finds that the number of mergers is associated with investment in plant and equipment, the level of stock prices, and industrial production. In the analysis of timing, he finds suggestions that upswings in mergers precede both upswings in investment in plant and equipment and, with a longer lag, upswings in stock prices. Nelson also reports that peaks in the number of mergers precede business cycle peaks. He concludes that the number of mergers is a leading indicator of economic activity particularly during expansions.

A more recent study by Melicher, Ledolter, and D'Antonio also finds that merger activity is positively correlated with industrial production and stock prices.[14] The authors claim that the number of mergers changes after stock prices change rather than before. In addition, they find that changes in bond yields help predict changes in the number of mergers.

Modeling mergers

Two statistical models are used here to analyze the linkages between mergers and the macroeconomy. The equations in these models are summarized in Table 2. The first model measures the linkages from real and financial activity to mergers. The equations in this model measure the association between current measures of merger activity and past values of macroeconomic variables. A finding of a statistically significant association between mergers and a particular macroeconomic variable in these regressions indicates that fluctuations in that particular variable precede fluctuations in mergers. Hence, the behavior of this macroeconomic variable helps predict merger activity.[15]

[13] See Nelson, *Merger Movements in American Industry, 1895-1956*, 1959 and "Business Cycle Factors in the Choice...," 1966.

[14] See Melicher, Ledolter, and D'Antonio, "A Time Series Analysis...," 1983.

[15] The finding that past values of one variable are significantly associated with current values of a second variable does not establish that changes in the first variable cause changes in the

TABLE 2
Merger equations

Model I: Linkages from real and financial activity to mergers

$$N_t = a + b_1(L)SP500_{t-1} + b_2(L)TBILL_{t-1} + b_3(L)DEBT_{t-1} + b_4(L)M1_{t-1} + b_5(L)CAPUT_{t-1} + b_6(L)GNP_{t-1} + e_t$$

$$V_t = a + b_1(L)SP500_{t-1} + b_2(L)TBILL_{t-1} + b_3(L)DEBT_{t-1} + b_4(L)M1_{t-1} + b_5(L)CAPUT_{t-1} + b_6(L)GNP_{t-1} + e_t$$

Model II: Linkages from mergers to real and financial activity

$$X_t = a + b_1(L)SP500_{t-1} + b_2(L)TBILL_{t-1} + b_3(L)DEBT_{t-1} + b_4(L)M1_{t-1} + b_5(L)CAPUT_{t-1} + b_6(L)GNP_{t-1} + b_7(L)N_{t-1} + e_t$$

$$X_t = a + b_1(L)SP500_{t-1} + b_2(L)TBILL_{t-1} + b_3(L)DEBT_{t-1} + b_4(L)M1_{t-1} + b_5(L)CAPUT_{t-1} + b_6(L)GNP_{t-1} + b_7(L)V_{t-1} + e_t$$

Definitions:

N_t = Number of mergers

V_t = Value of consideration paid for acquired firms

$SP500_t$ = Standard and Poor's comprehensive index of stock prices

$TBILL_t$ = Yield on 3-month Treasury bills

$DEBT_t$ = Domestic nonfinancial debt

$M1_t$ = M1 measure of the stock of money

$CAPUT_t$ = Capacity utilization rate

GNP_t = Gross national product

X_t = Any one of the macroeconomic variables, i.e., any one of the following: $SP500_t$, $TBILL_t$, $DEBT_t$, $M1_t$, $CAPUT_t$, or GNP_t

e_t = Zero mean, finite variance error

a = Constant

$b_i(L)$ = Fourth-order unrestricted polynomial in the lag operator L

Note: The Standard & Poor's index and capacity utilization rate are in logs; the Treasury bill yield is the ex-post real yield; and debt, M1, and GNP are in log billions of 1982 dollars.

The second model measures the linkages from mergers to real and financial activity. In this model, the associations between current values of macroeconomic variables and measures of past merger activity are calculated. The finding of a statistically significant association between mergers and a macroeconomic variable here indicates that merger activity may influence that macroeconomic variable. Lagged values of macroeconomic variables are included as explanatory variables in these equations to ensure that the estimated effect of the merger variables isolates the independent influence of merger activity. These lagged macroeconomic variables account for the influence of swings in economic activity that might simultaneously affect mergers and real and financial variables.

Two measures of merger activity are used: the number of mergers in a quarter and the value of all assets given in exchange for acquired firms in a quarter. The data on merger activity come from two sources. Data for the 1960-79 period were taken from the FTC's large merger series. (See footnote 9.) The data for later years were taken from the database compiled by *Mergers and Acquisitions* magazine.[16] The latter measure, the aggregate value of mergers, is theoretically more appropriate. However, reliable information on this value cannot be obtained for many mergers. Because the number of mergers is reported more accurately, it is a useful indicator of the volume of merger activity. Six macroeconomic variables are included in the analysis: the Standard & Poor's comprehensive index of stock prices, the yield on 3-month Treasury bills, the stock of money, the stock of domestic nonfinancial debt, the capacity utilization rate, and GNP.

It is possible to distinguish in these two models between short-run and long-run associations between variables. A significant short-run association between an explanatory variable and the variable being modeled means that a temporary deviation from the average value in the explanatory variable helps predict future temporary movements in the variable being modeled. A significant long-run association means permanent shifts in the level of the explanatory variable predict permanent changes in the level of the variable being modeled.[17]

Macroeconomic determinants of mergers

Table 3 reports estimates of the short-run and long-run associations between mergers and macroeconomic variables in the model where the linkages run from real and financial variables to merger activity. Estimates of this model suggest that macroeconomic variables account for about one-third of the fluctuations in merger activity.[18] Thus, two-thirds of the fluctuations in merger activity can be regarded as due to factors not captured in this model.

second variable. It is always possible that there are other variables omitted from the analysis that are the cause of the fluctuations in both the variables being analyzed. However, if there is a plausible theory that predicts a statistically significant association between these two variables, then confirming that association lends credence to the theory.

[16] The FTC data include mergers of large firms in mining and manufacturing. The data from *Mergers and Acquisitions* magazine contain information on mergers of firms in all industries and also include mergers of much smaller firms. These two series were made comparable by first eliminating the part of each series that can be explained by its own recent past. The remaining portion of each series was normalized and the series were combined.

[17] Formally, the joint significance of the lag coefficients is regarded as a significant short-run association. The significance of the sum of the lag coefficients is regarded as a significant long-run association.

[18] The R^2 statistic for the regression of the number of mergers against macroeconomic variables is 0.32. The R^2 statistic for the regression of the value of mergers against macroeconomic variables is 0.34. Note that the portion of merger fluctuations that could be predicted solely on the basis of past merger activity was removed from these merger measures before the equations were estimated.

TABLE 3
Estimated merger equations: Model I
(Tests for the influence of macroeconomic variables on merger activity)

	Dependent Variable			
	Number of mergers†		Value of mergers‡	
Explanatory Variable	Short run	Long run§	Short run	Long run§
SP500				
F-statistic	4.38	0.39 (+)	1.52	4.80* (+)
TBILL				
F-statistic	2.54*	7.53* (-)	1.54	2.28 (-)
DEBT				
F-statistic	2.73*	2.00 (+)	0.87	3.17* (+)
M1				
F-statistic	0.90	0.42 (-)	1.96	2.43 (-)
CAPUT				
F-statistic	2.36*	2.47 (+)	2.54*	0.17 (+)
GNP				
F-statistic	1.50	4.38* (-)	3.82*	3.35* (-)

* Asterisks indicate relationships that are statistically significant at the 10 percent level.
† 1960:Q1-1985:Q3
‡ 1961:Q4-1985:Q3
§ Plus and minus signs in parentheses indicate the sign of the long-run effect.

Note: The figures in this table are the F-statistics for the tests of the hypotheses that each of the macroeconomic variables influences merger activity.

These factors may include changes in regulations, innovations in capital markets, and technological advances that alter the competitive positions of existing firms.

As was noted above, changes in the interest rate affect the cost of mergers by changing the cost of borrowed funds. Changes in interest rates also affect the attractiveness of mergers by changing the return to lending cash instead of using it for acquisitions. In these data, the number of mergers is strongly affected by changes in the yield on 3-month Treasury bills. Both short-run and long-run increases in this yield depress the number of mergers. As shown in Table 3, the F-statistic for the short-run effect of Treasury bills on the number of

mergers is 2.54, which implies that this effect is statistically significant at the 10 percent level. The F-statistic for the long-run effect is 7.53, which implies that the long-run effect also is significant at the 10 percent level. Given the strength of this relationship between the Treasury bill yield and the number of mergers, it is surprising that there is no significant influence of this yield on the value of mergers. However, reports of the value of mergers are less complete and less reliable than reports of the number of mergers. This could account for the lack of a significant association.

The idea that firms are acquired because the value of their shares is less than the price they might command after a merger has gained acceptance. Other researchers have extended this notion to include the possibility that, in this sense, average stock prices may be too low and, therefore, may induce a rash of mergers. As was pointed out above, Nelson and Melicher, Ledolter, and D'Antonio found some statistical evidence of a positive association between the average level of stock prices and merger activity.[19] Nelson's evidence suggested that mergers precede movements in stock prices, while Melicher, Ledolter, and D'Antonio's evidence suggested the opposite—that stock price movements precede merger activity.

These data show the positive relationship between stock prices and mergers found by Melicher, Ledolter, and D'Antonio; that is, rises and falls in stock prices precede rises and falls in merger activity. However, in contrast to their findings, this relationship is not statistically significant. In the short run, fluctuations in both the number and value of mergers are unrelated to fluctuations in the stock market. Permanent increases in the index of stock prices are significantly associated with increases in the value of mergers. However, this relationship probably reflects the fact that acquisitions cost more when the market value of all firms is higher.

It was suggested earlier that fluctuations in the stocks of money or nonfinancial debt might affect merger activity because they imply changes in the pool of liquid assets available for corporate acquisitions. In these data, the stock of debt exhibits a puzzling relationship with merger activity. In the short run, increases in debt lead to reductions in the number of mergers. In the long run, however, such increases lead to increases in the aggregate value of mergers. The increase in the value of mergers in the long run may reflect strategic behavior on the part of acquiring and target firms. Acquiring firms may sell bonds to accumulate a "war chest" of cash. Potential target firms may take on debt to repurchase their own shares and to make themselves less attractive to acquirers. The short-run association between debt and the number of mergers is not easy to explain.

There is no evidence in these data of any relationship between mergers and the stock of money as measured by M1, the sum of currency and checkable deposits. Both in the short run and the long run, the number and value of mergers are unaffected by changes in M1.

These data support the notion that mergers are best understood as an alternative to purchases of new plant and equipment, an idea advanced by Nelson.[20] Short-run changes in the capacity utilization rate lead to significant changes in both the number and the value of mergers. This result is in accord with the

[19] See Nelson, *Merger Movements in American Industry, 1895-1956*, 1959 and "Business Cycle Factors in the Choice...," 1966, and Melicher, Ledolter, and D'Antonio, "A Time Series Analysis...," 1983.

[20] See Nelson, "Business Cycle Factors in the Choice...," 1966.

notion that firms regard mergers as a way of speeding up the increase in capacity normally achieved through construction of new plants and purchases of equipment. Fluctuations in the capacity utilization rate appear to have no long-run effects on merger activity. The absence of any long-run impact is also consistent with the view that mergers and capital investment are regarded as substitutes by the firm. In the long run, only new investment can satisfy an aggregate desire to increase production.

Both the research by Nelson and the series displayed in Chart 1 suggest that peaks in merger activity come before peaks in general economic activity. In other words, increases in real GNP precede declines in the number and value of mergers. This timing relationship is confirmed by the figures in Table 3. Current changes in GNP show a significant negative association with future changes in merger activity.

Do mergers have macroeconomic effects?

In addition to looking at the macroeconomic determinants of mergers, some economists have emphasized the linkages running from mergers to macroeconomic activity. Thus, some research has suggested that merger activity may be a leading indicator of movements in stock prices or real activity.[21] More recently, attention has focused on the possibly detrimental effects of mergers on financial markets. Members of Congress have asked the Board of Governors of the Federal Reserve System whether merger-related demand for credit might drive up interest rates and discourage other business borrowing.

Questions also have been raised about whether merger activity might distort the behavior of the monetary aggregates that the Federal Reserve uses in guiding monetary policy. During 1985, the narrowly defined transactions measure M1 exceeded its target range, while the broader domestic nonfinancial debt measure grew above its monitoring range in both 1984 and 1985. Some have attributed a portion of excessive growth in these aggregates to merger activity.[22]

To examine the linkages running from mergers to the macroeconomy, the equations listed in Model II were estimated over the 1960-85 time period. This model tries to explain the behavior of such macroeconomic variables as interest rates, money, stock prices, and GNP in terms of previous values of the number or value of mergers as well as previous values of the macroeconomic variables. Table 4 reports F-statistics for the two merger variables in each of the equations explaining the macroeconomic variables. In each case, the effect of the merger variables is statistically insignificant. That is, neither the number of mergers nor the value of mergers makes a statistically significant contribution to the explanation of the behavior of the macroeconomic variables. Thus, over the 1960-85 period, there does not appear to be a measurable feedback effect of mergers on real or financial activity.

In evaluating these results, however, it is important to remember that the model used here is designed to reveal systematic associations that have remained stable over the last two-and-a-half decades. There may have been specific historical episodes where merger activity had a temporary impact on specific real or financial variables, but such episodes are difficult to model. The results of this study

[21] See, for example, Nelson, *Merger Movements in American Industry, 1895-1956*, 1959 and "Business Cycle Factors in the Choice...," 1966, and Melicher, Ledolter, and D'Antonio, "A Time Series Analysis...," 1983.

[22] See, for example, *The Sommers Letter*, September 19, 1985.

TABLE 4
Estimated merger equations: Model II
(Tests for the influence of merger activity on macroeconomic variables)

Explanatory Variable	Dependent Variable					
	SP500	TBILL	DEBT	M1	CAPUT	GNP
Number of mergers*						
Short run	1.72	0.20	0.60	0.24	0.71	0.18
Long run	1.58	0.66	0.28	0.58	0.63	0.54
Value of mergers†						
Short run	0.98	1.18	0.24	0.39	0.45	0.78
Long run	0.11	0.66	0.22	0.10	1.31	0.01

* 1960:Q1-1985:Q3
† 1961:Q4-1985:Q3

Note: The figures in this table are the F-statistics for the tests of the hypotheses that merger activity influences each of the macroeconomic variables. None of the F-statistics are significant at the 10 percent level.

do suggest, though, that care should be exercised in extrapolating these episodes into a systematic linkage from mergers to economic activity.

Conclusions

This article examined the relationship between merger activity and the business cycle. During the last four decades, merger activity has been strongly procylical, growing more rapidly during expansions and more slowly during recessions. The empirical analysis in this article measured the extent to which aggregate cyclical fluctuations have accounted for the variations in merger activity and identified the macroeconomic variables that have been most responsible for changes in merger activity. The analysis also examined the recent conjecture that mergers disrupt the normal functioning of the macroeconomy, particularly of credit markets.

About a third of the variation in aggregate merger activity can be attributed to changes in macroeconomic conditions. Of the macroeconomic factors considered, changes in real interest rates appear to have the greatest influence on merger activity. This influence may reflect the dependence of acquiring firms on debt financing. Capacity utilization also affects merger activity in the short run, indicating that firms may choose to expand through acquisitions rather than through traditional investments in plant and equipment when there are substantial delays in obtaining delivery of new capital goods.

In contrast, macroeconomic variables seem utterly unresponsive to any change in the volume of mergers. Mergers show no systematic impact on interest rates or on debt levels, two variables for which a relationship has been hypothesized. Thus, concerns that merger activity may have detrimental effects on the macroeconomy do not appear to be justified.