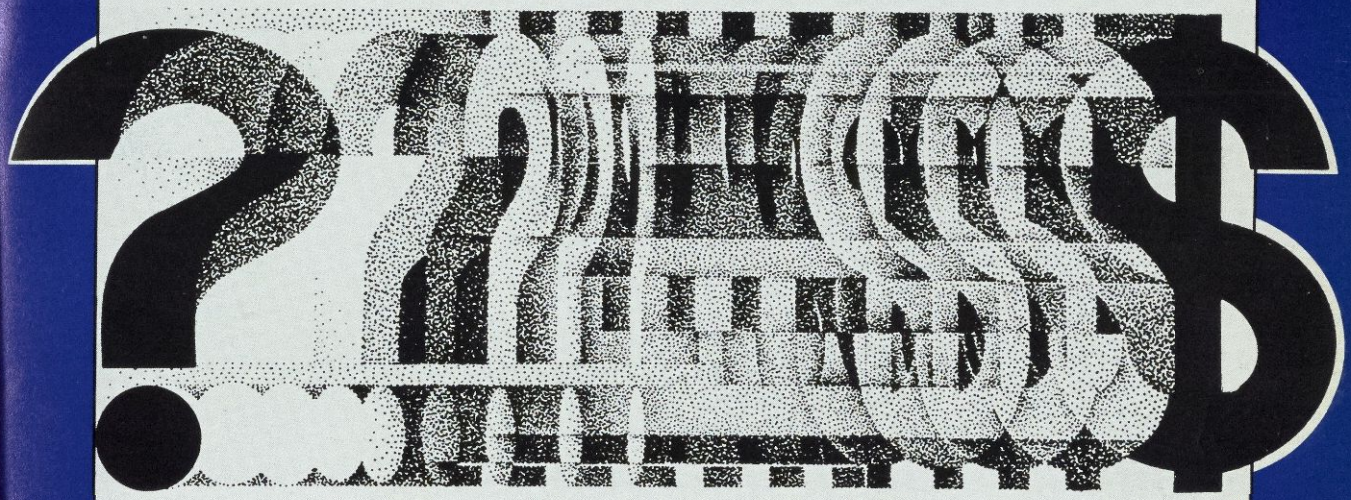
Economic Review

FEDERAL RESERVE BANK OF ATLANTA

MAY/JUNE 1988

FINANCIAL MARKETS

Are Futures a Guide to Stock Prices?



CORPORATE FINANCE

Debt Ratios of U.S. Corporations

FORESTRY

After the 1986 Tax Act

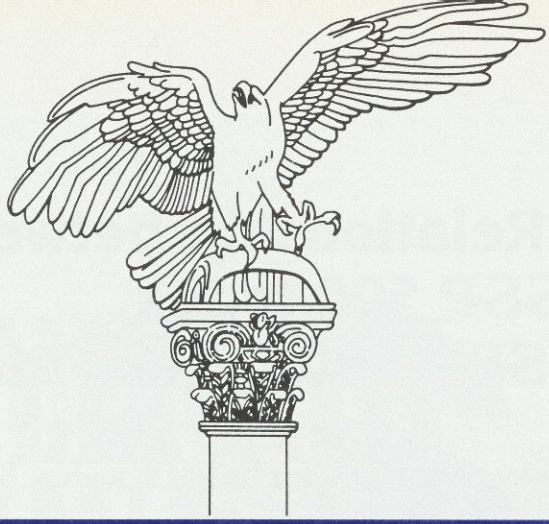
Economic Review

The **Economic Review** seeks to inform the public about Federal Reserve policies and the economic environment and, in particular, to narrow the gap between specialists and concerned laypersons.

Views expressed in the **Economic Review** are not necessarily those of this Bank or of the Federal Reserve System.

Free subscriptions and limited additional copies are available from the Public Information Department, Federal Reserve Bank of Atlanta, 104 Marietta Street, N.W., Atlanta, Georgia 30303-2713 (404/521-8788).

ISSN 0732-1813



The Relationship between the S&P 500 Index and S&P 500 Index Futures Prices

Ira G. Kawaller, Paul D. Koch, and Timothy W. Koch

The Standard and Poor's 500 Index and the related index futures prices are influenced by their own histories, each other's movements, and current market information. This study explores the temporal relationship between these two important market indicators and measures the change in this relationship as futures expiration day approaches.

The advent of markets for stock index futures and options has profoundly changed the nature of trading on stock exchanges. These markets offer investors flexibility in altering the composition of their portfolios and in timing their transactions. Futures and options markets also provide opportunities to hedge the risks involved with holding diversified equity portfolios. As a consequence, significant portions of cash market equity transactions are now tied to futures and options market activity.

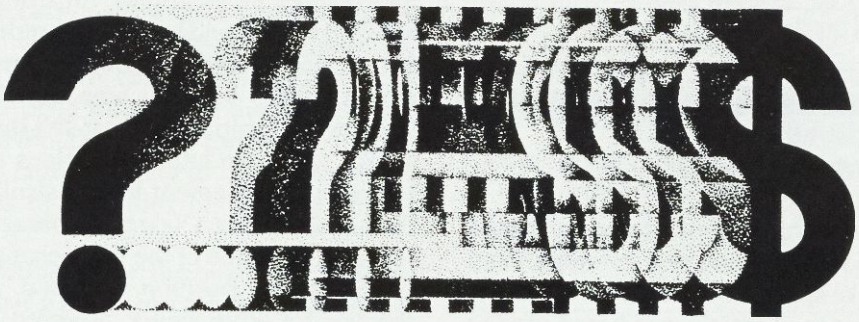
The effect of the stock index futures and options markets on traditional stock trading has aroused both the ire of critics and the acclaim of supporters. Critics allege that futures trading unduly influences the underlying equity markets, especially on days when futures contracts expire. For example, on various expiration days from 1984 to 1985, the stock markets closed with equity prices either rising or falling dramatically during the final hour of trading.[1] The phenomenon of sharp price swings and the seeming relation to futures market activity has, especially in the wake of the October 19, 1987, stock market crash, prompted various suggestions for modifying the design of the contracts to lessen their impact on the market.[2] (For a related discussion, see this issue's *Book Review* by Peter A. Abken on p. 36.)

Proponents of futures markets, on the other hand, do not view the final-day price swings as a problem, since the swings are generally temporary and nonsystematic. In fact, proponents argue that such markets provide an important price discovery function and offer an alternative marketplace for adjusting equity exposure. The term *price discovery function* refers to the ability to use a certain market indicator—in this case, stock index futures—to forecast upcoming changes in the prices of securities. For the price discovery function to be most helpful, though, an investor must be able to determine *when* a change in the futures market will be reflected in the underlying market.

This article addresses some basic questions that have a fundamental bearing on the debate between the critics and advocates of futures markets. Do intraday movements in the index futures price provide predictive information

---

The authors are Director of the New York office of the Chicago Mercantile Exchange; Associate Professor of Finance at the University of Kansas and former visiting scholar at the Federal Reserve Bank of Atlanta; and Chair of Banking at the University of South Carolina, respectively. These views are the authors' and do not necessarily reflect those of the Chicago Mercantile Exchange, the Federal Reserve Bank of Atlanta, or the Federal Reserve System. *A more comprehensive description of this study, which reports the theoretical model and empirical results in detail, was published as "The Temporal Price Relationship between S&P 500 Futures Prices and the S&P 500 Index,"* The Journal of Finance *(December 1987).*



about subsequent movements in the index, or do movements in the index presage futures price changes? Is the price relationship different on expiration days and the days leading up to expiration?

Analysis of the Standard and Poor's (S&P) 500 futures and the S&P 500 index can help answer these questions. This article shows that lags exist not only between movements in index futures prices and subsequent movements in the index, but also between the index and subsequent index futures prices, though these lags are not symmetrical. The index lags behind the index futures price by up to 45 minutes, but the index futures price tends to trail the index only briefly. Examination of the lagged relationships on expiration days and the days prior to them indicates that the relationships are remarkably stable, implying that neither expiration day volatility nor the climate preceding these days interferes with the price discovery function that index futures seem to offer.[3]

An Overview of the S&P 500 Index and Index Futures

The S&P 500 stock index represents the market value of all outstanding common shares of 500 firms selected by Standard and Poor's. Prior to April 6, 1988, this group always consisted of 400 industrials, 40 financial institutions, 40 utilities, and 20 transportation firms.[4] Though all of the shares are not traded on the New York Stock Exchange (NYSE), the cumulative market value equals approximately 80 percent of the aggregate value of NYSE-listed stocks. The index changes whenever the price and thus the cumulative market value of any underlying stock changes.

An S&P 500 futures contract represents the purchase or sale of a hypothetical basket of the 500 stocks underlying the S&P 500 index, set in a proportion consistent with the weights set by the index, with a market value equal to the futures price times a multiplier of 500. The futures price should be tied to the cost of investing in and carrying an S&P 500 look-alike basket of stocks until the expiration of the index future. The cost of carry incorporates transactions fees, taxes, and the expense of financing the investment, minus the dividends derived from the basket of stocks and any additional reinvestment income.

As a requirement for gaining access to the market, traders must post an initial margin deposit or collateral equal to a fraction of the futures contract market value (price x 500). Futures prices change intermittently throughout each trading day, and at day's end traders must cover any losses when prices move against

them. Alternatively, they may withdraw any profit in excess of their initial margin requirement should prices move favorably. During the period from which data for this study were drawn, contracts expired on the third Fridays of March, June, September, and December, with the futures contracts marked to the closing index value at 4:15 p.m., Eastern time.[5]

Basic Functions of Stock Index Futures

Stock index futures typically serve three functions: trading, hedging, and arbitrage. First, traders can take speculative positions in futures to take advantage of anticipated broad market price movements. Second, hedging, which involves the purchase or sale of index futures in anticipation of an intended cash market trade, compensates for adverse price moves in the cash market, and thus reduces aggregate risk. Simple hedges typically involve the purchase (sale) of an asset in the cash market and sale (purchase) of futures contracts on the same asset. As long as the cash-futures spread remains the same and the costs of effecting and financing the transaction are covered, gains (losses) on the cash market purchase are countered by losses (gains) on the future. The investor thus may mitigate the risk of loss and the possibility of gain on the cash market purchase.

Arbitrage is a third strategy served by stock index futures. It involves the simultaneous purchase and sale of stocks and futures and subsequently enables an investor to capture profits from realignments of relative prices following an apparent inconsistency in the index and the index futures price. When the index futures price moves outside the range determined by the cost of the look-alike basket and the cost of carry, arbitrage will tend to drive the futures price and the index toward their cost-of-carry relationship. If the actual futures price is higher than the cost of the look-alike basket and the cost of carry, the futures contract is overvalued, justifying the purchase of the look-alike basket of stocks and the simultaneous sale of the futures contract. If the futures price falls below the price of the look-alike portfolio plus the cost of carry, the futures contract is undervalued, and the reverse trade would be profitable. In both cases, the arbitrage transactions realign the futures price and the index.

Because physical delivery does not take place, the futures contract is said to be "settled in cash." Cash settlement is an important feature of stock index futures. An arbitrageur who has sold futures and bought the underlying basket of stocks does not deliver the basket of stocks to the investor who bought futures. Instead the arbitrageur must sell the basket of stocks. Any open futures positions are marked to the final settlement index calculation when the futures expire. Once the arbitrageur pays or receives the value of the price change from the prior day, the position is closed. A common practice for arbitrageurs, however, is to trade large blocks of stocks or whole portfolios at prices tied to closing prices on the futures expiration days. As a result, these large volumes of orders late in the day have tended, on some occasions, to create at least temporary imbalances in the cash equity markets.

Movements in Futures Prices. Numerous studies have explained the price relationship between stock index futures and the underlying stocks in terms of arbitrage behavior. Futures prices normally vary relative to stock prices within ranges that are not sufficient to trigger arbitrage. In fact, arbitrage opportunities are often not available. A number of scholars have attempted to identify and measure arbitrage trading boundaries.[6] Their results indicate that the futures to cash price differential, referred to as the *basis,* should fall within boundaries determined by the cost of carry. Because market interest rates have historically exceeded the dividend rate on common stocks, the "fair value" or theoretical stock index futures price normally exceeds the stock index.[7]

Conventional wisdom among professional traders dictates that movements in the S&P 500 futures price affect market expectations of subsequent movements in cash prices. The futures price presumably embodies all available information regarding events that will affect cash prices. Purchase or sale of index futures requires one transaction, while purchase or sale of a look-alike portfolio generally involves 200 or more stocks and a minimum $5 million investment. Consequently, the index futures price is

likely to respond to new information more quickly than cash market prices in general and, thus, more quickly than the S&P 500 index. This lag of the index behind the futures price results because the underlying stocks must be traded in order for the index to reflect a change in value. Since most index stocks do not trade each minute, the cash market responds to the new information with a lag.[8] S&P 500 index movements may similarly convey information about subsequent price variation in the futures contract; however, the lag of the futures price behind the index is likely to be much shorter than the lag of the index behind the futures price.

If new information on the health of the economy is bullish, a trader has the choice of buying either S&P 500 futures or the underlying stocks. While the futures trade can be effected immediately with little up-front cash, actual stock purchases require a greater initial investment and may take longer to implement since they require a subsequent stock selection. This preference for index futures as a vehicle for speculative transactions explains why changes in futures prices may lead changes in stock prices and the S&P 500 index. Futures prices may thus provide an indicator of forthcoming cash prices, which follow when investors who are unwilling or unable to use futures incorporate the same information that led to changes in futures prices into their own cash market transactions.

Changes in the S&P 500 index can also lead changes in the futures price, if the value of the index conveys information that affects futures prices. Futures traders are likely to incorporate recent changes in the index in their pricing decisions. For example, if the index declines because investors are selling stocks connected with options trading, the decline may induce a change in sentiment that is reflected in subsequent futures prices.[9]

Potential lead and lag patterns between index futures and the index are complicated by two more possible relationships: the futures and the index may move together as new information affects both index futures and cash market trades. Each measure may lead the other as market participants find clues about impending values of index futures and broad market movements in previous futures prices and broad cash market movements, respectively. Technical analysts, or chartists, rely heavily on patterns of relationships between past and future values of series such as the S&P 500. A summary of possible relationships between the S&P 500 index and S&P 500 futures prices is shown in Table 1.

Table 1.
Possible Effects of Movements in the S&P 500 Index and S&P 500 Index Futures

Movement in the S&P 500 Index	
may be affected by	**may affect**
• prior index levels	• upcoming index levels
• current futures prices	• upcoming futures prices
• prior futures prices	
• other market information	

Movement in S&P 500 Index Futures Prices	
may be affected by	**may affect**
• prior futures prices	• upcoming futures prices
• current index levels	• upcoming index levels
• prior index levels	
• other market information	

Tests of the Intraday Relationship between S&P 500 Futures and the S&P 500 Index

A complex set of potential relationships could exist between S&P 500 futures and the S&P 500 index prices. Movements in each are thought to be influenced by the past and current movements of both as well as by other market information. The study reported on in this article tried to gauge the magnitude and variability of the relationships between the index and the futures by estimating distributed lags between the two prices. Distributed lags employ a method of weighting past data to determine their effects on the data under study.

The pattern of lags between index futures and the index may not be constant over time. While shifting patterns are conceivable throughout the life of the futures contract, the focus of interest on expiration day effects begs the question of whether these temporal relationships show any differentiation on those days. On expiration days, the traders' need to close positions may generate market imbalances that could conceivably overwhelm the mechanism by which new information influences index futures and cash market prices. An expiration-day breakdown in this mechanism would diminish the benefits of the index futures market—at least on expiration day—as a medium for discovery.

The data are minute-by-minute prices of index futures contracts and the S&P 500 index on all trading days in 1984 and 1985. The Chicago Mercantile Exchange provided the data.[10] Pairing the reported index with the last index futures price quoted during the minute that the index appeared yielded 360 pairs of index and futures observations each day (six-hour trading day x 60 observations per hour). To judge whether the index futures-index relationship changes as the expiration day approaches, lags were estimated for six trading days in each quarter beginning in the second quarter of 1984 and ending with the last quarter of 1985.[11] The days are 88, 60, 30, and 14 days prior to expiration, 1 day prior to expiration, and expiration day. These days were chosen to represent the approach of expiration and the effect of this approach on the index futures-index relationship.

The nature and extent of the lead/lag relationships between index futures prices and the index were measured using a number of analyses. First, a time series analysis was performed to study the movements of futures prices relative to prior futures prices. Next, the same method of analysis gauged movement of the S&P 500 index based on past index performance. These time series analyses studied the minute-to-minute changes in both the index and the futures prices. The next step in the analysis was to construct a model to describe the dynamic intraday price relationships between the index and the futures prices. In this model, index movements depend on their own past movements, current and past movements in the futures price, and other relevant market information (see Table 1). Likewise, futures price movements are modeled to depend on their own past movements, current and past movements in the index, and other relevant market information.[12]

Consistent evidence on both the form of the lag relationships and their stability over time emerges from these tests: first, the contemporaneous relationship between futures prices and the index is quite strong—dwarfing the lagged relationships. In fact, the futures and index move almost in lock step. Second, lags between index futures prices and the index are not symmetrical. The index lags behind the index futures price by up to 45 minutes, while the futures price lags behind the index only briefly if at all. This result supports the contention that index futures do, in fact, serve a price discovery function. Third, the lagged relationships do not appreciably change as expiration day approaches or on expiration day itself.

Different patterns of lagged relationships between S&P 500 futures and the S&P 500 index are given in Chart 1. It shows the distributed lag coefficients for two days in the fourth quarter of 1984; results for other days in this contract period, as well as days in other contract periods, are quite similar. Typically, the first coefficient, which describes the contemporaneous relationship, is the greatest, or one of the greatest, on each day. In the panels showing lags from futures to the index, relatively large and statistically significant coefficients show up with lags as long as 45 minutes. Panels showing lags from the index to futures typically show the one-minute lag as the largest coefficient and the only one that is significant. These results parallel evidence garnered from earlier time-series analyses.[13]

Chart 1 also shows quite similar patterns in the distributed lag coefficients 88 days prior to expiration day and on expiration day. Coefficients showing the lead from futures to the index continue to be mostly positive even on expiration day. They are significant or nearly significant through 20 to 30 minutes on each day, though the lag appears somewhat less on expiration day. Other quarters record quite similar patterns.

Implications

Evidence uncovered in the tests of lagged relationships between S&P 500 index futures prices and the S&P 500 index points to the usefulness of the futures as a predictor of broad equity market movements measured by the index. The S&P 500 futures price and underlying index evidently respond to market information simultaneously, and the index shows lags of up to 45 minutes behind the futures. Importantly, the magnitudes of the contemporaneous effects on different days are consistently much larger than the lagged effects. Thus, though the price discovery function has been demonstrated, the indications of forthcoming cash market changes provided by past futures prices are not sufficient to provide an exploitable trading strategy.

Consistency in the lagged relationships over the days approaching expiration day and on expiration day also indicates that the pattern of lags between futures and the index is not disturbed by the closing out of arbitrage positions. This consistency implies that index futures trading continues to make its contribution to price discovery, even on expiration days that transpired without market activity restrictions.

Chart 1.
Sample Distributed Lags for the S&P 500 Index and S&P 500 Index Futures Prices

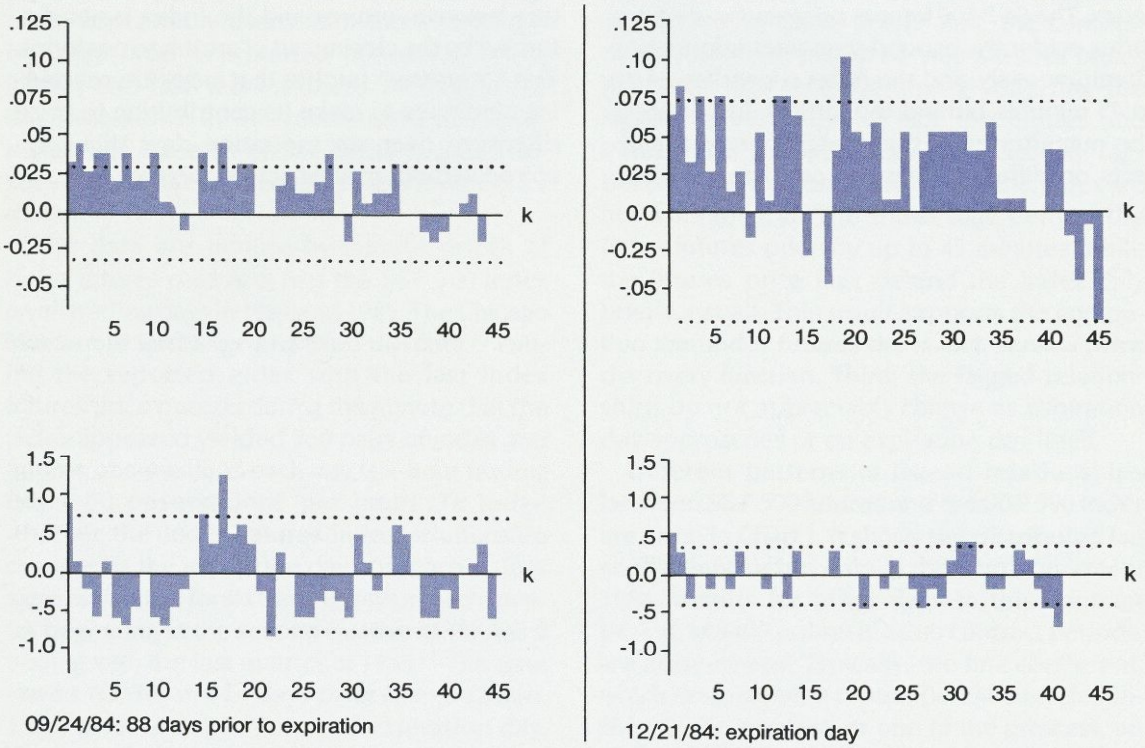


Chart 1 shows the relationship between minute-to-minute movements in the S&P 500 futures price and the S&P 500 index. The top graph in each set shows how past minute-to-minute movements in the futures price affect current movements in the index, and the bottom figure shows how past movements in the index affect current movements in the futures price.

The vertical axis in each figure represents the magnitude of the minute-to-minute impacts of each value on the other. The horizontal axis charts the number of minute-to-minute lags incorporated into the model. For example, for k = 1 minute lag, the value plotted in the top graph shows the impact of the futures price change one minute earlier on the current index value. At the number '20' on the horizontal axis, the effect on the current index value of the futures price 20 minutes earlier is plotted.

When the vertical lines within the graph fall between the two dotted horizontal lines, the magnitude of the distributed lag coefficient is less than twice its standard error, and thus is not statistically significant. When the vertical lines within the graph fall outside the dotted lines, the magnitude of the distributed lag coefficient is more than twice its standard error, and, thus, is statistically significant.

When the vertical lines are concentrated in the positive portion of the figure (above 0.0), most of the lagged impacts of one price on the other are positive, that is, increases in one price are then followed by increases in the other price.

When the vertical lines are concentrated in the negative portion of the figure (below 0.0), most of the lagged impacts of one price on the other are negative, that is, increases in one price are then followed by decreases in the other.

Notes

[1]The term "triple witching hour" was used to describe this trading period because the Chicago Mercantile Exchange's (CME) S&P 500 futures, the Chicago Board of Trade Options Exchange's (CBOE) S&P 100 options, and contracts on individual stock options all expired on the third Fridays of March, June, September, and December. After March 1987, the final day of trading for S&P 500 futures was moved to the day prior.

[2]The U.S. Securities and Exchange Commission, the Government Accounting Office, and the executive branch (the Brady Commission), as well as various exchange and private research groups, are currently studying the relation of price swings to futures market activity.

[3]These results do not explain expiration day swings, nor do they suggest that such swings are desirable.

[4]Standard and Poor's has recently announced that the composition of the S&P 500 will now be flexible.

[5]Since this study, the final settlement procedures for S&P 500 futures have changed. Contracts currently expire one business day prior to the third Friday of the contract month, with the final settlement price based on a special calculation of the Friday opening prices for each of the 500 stocks. Upon expiration, one final cash adjustment is made to reflect the last day's gains or losses.

[6]Cornell and French (1983a, b); Figlewski (1984a, b); Modest and Sundaresan (1983); and Stoll and Whaley (1986).

[7]The theoretical upper and lower bounds are discussed extensively in the literature. For example, see Stoll and Whaley (1986): 8-10, or Kawaller (1987): 447-49.

[8]New information could affect a subset of index stocks disproportionately relative to the entire stock market. In such cases, not all index stocks must be traded each minute for the index to adjust completely and quickly to new information.

[9]In options trading, an investor purchases the right to buy or sell a given security at a fixed strike price before a specific date in the future. If the investor does not exercise this right before the date in the contract, the option expires and the option buyer forfeits the money.

[10]At the time of this study, the index was available only each minute. Since then, index quotations have been calculated and disseminated at about 15-second intervals.

[11]Prior to the June 1984 contract, S&P 500 futures expired on Thursdays. This article's sample is restricted to the last three contracts in 1984 and all contracts that expired in 1985. Also note that futures trade for 15 minutes after the stock markets close. Quotes from these 15 minutes are not considered in this analysis. Finally, since September 30, 1985, quotes are available beginning at 8:30 a.m., but the analysis is restricted to the six hours (360 observations) from 9:01 a.m. and 3:00 p.m. so that the results can be compared across quarters.

[12]In the context of this model, zero restrictions are tested on the distributed lag coefficients, allowing, alternately, the contemporaneous coefficient and the coefficient at lag one minute to remain unconstrained. See Kawaller, Koch, and Koch (1987) for details.

[13]The tests with no restrictions on the contemporaneous and first coefficients also confirm the longer lags from the futures to the index and the very short lag from the index to the futures.

Bibliography

Cornell, Bradford, and Kenneth French. "The Pricing of Stock Index Futures." *Journal of Futures Markets* 3 (Summer 1983a): 1-14.

_____, and _____. "Taxes and the Pricing of Stock Index Futures." *Journal of Finance* 38 (June 1983b): 675-94.

Elton, Edwin J., Martin J. Gruber, and Joel Rentzler. "Intra-day Tests of the Efficiency of the Treasury Bill Futures Market." *Review of Economics and Statistics* 66 (February 1984): 129-37.

Figlewski, Stephen. "Explaining the Early Discounts on Stock Index Futures: The Case for Disequilibrium." *Financial Analysts Journal* 40 (July-August 1984a): 43-47.

_____. "Hedging Performance and Basis Risk in Stock Index Futures." *Journal of Finance* 39 (July 1984b): 657-69.

_____. "Hedging with Stock Index Futures: Theory and Application in a New Market." *Journal of Futures Markets* 5 (Summer 1985): 183-99.

Gastineau, Gary, and Albert Madansky. "S&P 500 Stock Index Futures Evaluation Tables." *Financial Analysts Journal* 39 (November-December 1983): 68-76.

Geweke, John. "Testing the Exogeneity Specification in the Complete Dynamic Simultaneous Equations Model." *Journal of Econometrics* 6 (April 1978): 163-85.

Granger, Clive W. "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods." *Econometrics* 37 (July 1969): 423-38.

Haugh, Larry D. "Checking the Independence of Two Covariance-Stationary Time Series: A Univariate Residual Cross-Correlation Approach." *Journal of the American Statistical Association* 71 (June 1976): 378-85.

Kawaller, Ira G. "A Comment on Figlewski's 'Hedging with Stock Index Futures: Theory and Application in a New Market.' " *Journal of Futures Markets* 5 (Fall 1985): 447-49.

_____. "A Note: Debunking the Myth of the Risk-Free Return." *Journal of Futures Markets* 7 (June 1987): 327-31.

_____, Paul D. Koch, and Timothy W. Koch. "The Temporal Price Relationship between S&P 500 Futures Prices and the S&P 500 Index." *Journal of Finance* 5 (December 1987): 1309-29.

Koch, Paul D., and James F. Ragan, Jr. "Investigating the Causal Relationship Between Wages and Quits: An Exercise in Comparative Dynamics." *Economic Inquiry* 24 (January 1986): 61-83.

Koch, Paul D., and Shie-Shien Yang. "A Method for Testing the Independence of Two Time Series that Accounts for a Potential Pattern in the Cross-Correlation Function." *Journal of the American Statistical Association* 81 (June 1986): 533-44.

Modest, David, and Mahadeaum Sundaresan. "The Relationship between Spot and Futures Prices in Stock Index Futures Markets: Some Preliminary Evidence." *Journal of Futures Markets* 3 (Summer 1983): 15-41.

Stoll, Hans R., and Robert E. Whaley. "Expiration Day Effects of Index Options and Futures." Vanderbilt University, March 1986.

U.S. Securities and Exchange Commission. Letter to the Honorable John D. Dingell, June 13, 1986a.

_____. Letter to Mr. Kenneth J. Leiber and others, June 13, 1986b.

_____. *Roundtable on Index Arbitrage*, July 9, 1986c.

Working Paper Series Available

The Research Department of the Federal Reserve Bank of Atlanta publishes a working paper series to stimulate professional discussion and exploration of economic subjects. We welcome readers of the *Economic Review* to complete and return the form below in order to receive new working papers as they are published. If you would like a copy of any of the current papers, simply check the box next to the paper's number.

William J. Kahley
Countervailing Advantage and Foreign Direct Investment in the United States
Working Paper 88-1

William Roberds
A Quarterly Bayesian VAR Model of the United States Economy
Working Paper 88-2

Jon R. Moen
The Shifting Structure of Occupations and the Effect on Labor Force Participation Rates of American Males, 1860 to 1980
Working Paper 88-3

Previous working paper series are also available. For more information, contact the Public Information Department, Federal Reserve Bank of Atlanta, 104 Marietta Street, NW, Atlanta, Georgia 30303-2713 (404/521-8788).

☐ Please start my subscription to the Working Paper Series.

☐ Please send me a copy of the following papers:

☐ 88-1 ☐ 88-2 ☐ 88-3

Name_____

Address_____

_____

City_____ State_____ Zip_____

Return to the Public Information Department, Federal Reserve Bank of Atlanta, 104 Marietta Street, NW, Atlanta, GA 30303-2713.

Leverage Ratios of U.S. Nonfinancial Corporations

Larry D. Wall

Gauging optimum leverage ratios for a corporation or for an economy is difficult since no model exists to determine these levels. By considering past data on the debt of U.S. firms and comparing present corporate debt-to-equity ratios with those of companies in competing economies, the author investigates whether companies are overleveraged or underleveraged.

Corporations fund their purchases of assets by issuing debt and stock, and by retaining their earnings. The use of debt by U.S. corporations may have important implications for individual firms and the economy. If debt levels are too low, companies' cost of funds may be overly high, implying that they are inefficiently managed. If debt levels are too high, the nation may be too vulnerable to severe economic downturns.[1]

One can find arguments that U.S. corporations' debt ratios are too high and too low. The case for believing that ratios are at approximately the correct level is based on the assumption that, on average, the corporate sector operates in the most efficient manner possible. However, some observers note that debt ratios of U.S. corporations appear to be below the debt ratios of their major international competitors, especially West German and Japanese firms. Richard R. Ellsworth (1983), for example, suggests that U.S. companies are underleveraged because their managers devote insufficient consideration to financial strategy. Ellsworth contends that U.S. firms could cut their cost of capital and become more competitive if they relied to a greater extent on debt financing.

Other observers including Henry Kaufman (1986), noting a substantial increase in leverage ratios since the end of World War II, typically argue that high debt levels could leave corporations excessively vulnerable to failure during a recession. As a result, a shock that might otherwise cause only a small downturn in the economy could cause a major recession.

This article examines the arguments that U.S. corporations are either underleveraged or overleveraged. No model currently exists that allows an easy answer to the question of whether leverage ratios are at optimum levels for the firm or the economy. Therefore, researchers must rely on empirical comparisons of historical and international data. A comparison of U.S. debt ratios with those of foreign firms does not support the argument that American companies are underleveraged. Examination of the historical data provides some support for the contention that U.S. firms are more leveraged than they were in the past, but debt ratios calculated on the basis of book value accounting data significantly overstate the magnitude of the increase in debt ratios.

The author is a senior economist in the financial section of the Atlanta Fed's Research Department. *He wishes to thank Sharon Fleming, Rob McDonough, Marilyn Shores, and Gretchen Lium for research assistance.*

Determinants of Corporate Financing Policies

Individual corporations choose debt levels based on the costs and benefits of leverage to the firm and its managers. This process may result in debt levels that are too high or too low. If a corporation's management focuses on its own gains and losses from leverage rather than the gains and losses to the corporation's shareholders, debt levels may be too low. Alternatively, debt levels may be too high if corporations do not consider the costs that debt can impose on society, such as an increase in the risk of recession.

Corporations face competitive pressure to choose the level of debt that maximizes firm value. Failure to maintain this level may raise the company's cost of funds and reduce its ability to compete. Failure to maximize value may also prompt a takeover attempt by others who will issue the amount of debt that will maximize the company's value. One of the first rigorous analyses of the problem of firm debt levels concludes that, under certain restrictive assumptions, leverage will have no effect on firm value. In a seminal paper, Franco Modigliani and Merton H. Miller (1958) show that if a change in leverage merely redistributes cash flow between owners and creditors, then a company's leverage will not influence its overall value.[2] Thus, to influence firm value, leverage must somehow alter the amount of cash flow returned from existing assets or investment in new assets.

Cash Flow and Taxes. Subsequent research on corporate leverage elaborates on the 1958 Modigliani and Miller model by analyzing the effect of leverage on operating cash flows and taxes. One way in which leverage will affect firm cash flows is shown in a subsequent paper by Modigliani and Miller (1963). They note that a firm can deduct interest payments, but not dividend payments, from its taxes. If a company increases its leverage, more cash flow will go to investors and less will go to the government because the company will pay lower taxes. If the only influence on corporate debt ratios were corporate taxes, the researchers' elaboration suggests, firms would be almost exclusively debt-financed.

Miller (1977) extends the analysis of taxes further to show that the incentive to use corporate leverage is reduced by personal taxes. He suggests that for individuals tax rates on bond returns are greater than tax rates on returns to equity. Moreover, this difference increases as an individual's marginal tax bracket rises. Thus, in order to induce individuals in successively higher tax brackets to purchase debt, the rate of return on corporate debt must increase as more is supplied. Accordingly, corporations on the whole will continue to issue debt until the tax benefits from debt are eliminated, that is, until the tax rate on corporations issuing debt equals the tax rate paid by the marginal investor in new debt securities. At that point, changes in a firm's leverage will not influence its value because the marginal tax consequences of debt and equity will be equal.

Benefits of leverage are reduced by individual taxes in a model developed by Harry DeAngelo and Ronald W. Masulis (1980), but taxes nevertheless influence individual corporate debt ratios. Higher debt ratios provide an advantage by reducing corporate taxes, but these ratios also provide a disadvantage in that they raise the possibility that the firm will be unable to exploit other provisions of the tax code. For example, by both taking on added debt and investing in new equipment, a company could reduce taxable income by the amount of depreciation and interest. Yet doing so might lower corporate earnings below the company's depreciation and interest expense. In this case, the firm may have to defer part of its tax savings to a future year or face losing the tax write-offs permanently. Companies in this model increase their debt ratios until the marginal tax gains from higher leverage are offset by the marginal expected cost of losing other tax privileges.

Costs of Financial Distress. A possible offset to the tax benefits of debt is that an increase in leverage can raise a corporation's probability of financial distress. Jerold B. Warner (1977) analyzes direct bankruptcy costs for a sample of failed railroads and finds that the direct costs are a small percentage of firm value—2.7 percent and 1.7 percent of total market value of traded securities for the largest corporations in his sample. His findings imply that the direct costs of bankruptcy are at most a minor determinant of corporate leverage decisions.

Nevins Baxter (1967) argues that the costs of failure go beyond the direct costs of bankruptcy. Firms approaching bankruptcy may lose potential customers and suppliers, as well as higher quality workers and managers. These firms may also be unable to raise funds to exploit profitable investment opportunities.

If bankruptcy costs were the only factor influencing leverage ratios, businesses would be financed entirely with equity. To the extent that businesses face both bankruptcy costs and tax advantages of debt, a mix of debt and equity is generally indicated.[3]

Agency Costs. A fundamental problem with models which rely solely on income taxes to generate corporate issuance of debt is that corporations used debt long before the adoption of income taxes. The application of agency theory to corporate finance by Michael C. Jensen and William H. Meckling (1976) provides a powerful tool for understanding corporate leverage. Agency theory recognizes that a corporation's owners, managers, and creditors may be different parties with different interests. Owners or managers may take actions that increase their own utility at the expense of the other two parties. The overall value of the firm might be reduced as well.

Managers in Jensen and Meckling's model earn pecuniary and nonpecuniary benefits, such as the size of their offices. For a manager who owns 100 percent of a firm, every dollar spent on nonpecuniary benefits reduces the manager's equity by one pretax dollar. However, if the manager owns 75 percent of the firm, each dollar spent on nonpecuniary benefits reduces the manager's return by 75 cents. Thus, managers who own 75 percent of their companies are more likely to spend on nonpecuniary benefits than those with 100 percent ownership. The costs of overspending on nonpecuniary benefits are ultimately borne by the owner-manager as potential shareholders reduce the price they pay for new stock in recognition of management's increased incentive to spend on perks.

Debt issues reduce the incentive for managers to spend resources on nonpecuniary benefits. Since debt issues contain unconditional promises to pay, debtholders need not bear the costs of nonpecuniary benefits unless managers overspend on these benefits and drive the company to bankruptcy.

Debt may also reduce management's incentive to waste resources even if the firm issues outside equity. Jensen (1986) notes that both interest payments on debt and dividend payments on equity holdings reduce the resources available for nonpecuniary benefits to management. However, while the firm must pay a market rate of interest on its debt, dividend payment need only be minimal.

Although debt financing may encourage more efficient management of existing assets, businesses cannot replace all of their existing outside equity with debt. Stewart C. Myers (1977) shows that a conflict between shareholders and creditors can arise over the firm's investment policy. Investment in new projects with a positive net present value may benefit a company's creditors by reducing its probability of bankruptcy. The value that creditors receive comes at the expense of the firm's shareholders and may, for some projects, be so large that the project will not enhance shareholders' wealth. Businesses with excellent growth potential may choose to avoid the potential conflict by minimizing debt levels. Michael S. Long and Ileen B. Malitz (1985) provide support for Myers' conclusion by showing that a firm's leverage is inversely related to its research and development (R&D) expenditures, since R&D is positively associated with growth opportunities.

"If bankruptcy costs were the only factor influencing leverage ratios, businesses would be financed entirely with equity. To the extent that businesses face both bankruptcy costs and tax advantages of debt, a mix of debt and equity is generally indicated."

Agency theory takes account of conflicting interests of owners, creditors, and managers. It shows that recognition of these conflicts will influence owners' and creditors' valuation of a company in such a way that their willingness to finance will vary with the amount of leverage. Consequently, financing costs will be affected

by leverage and a leverage ratio that maximizes the company's value will exist.

Costs of New Issues. An additional determinant of corporate financing policies is the cost of new debt and equity issues. Myers (1984) suggests that the costs of new issues—especially new equity issues—are so great that firms develop a "pecking order" of sources of additional funds. In this model, firms will turn first to internally generated funds from operations. When internally generated funds are exhausted, the corporation will seek to issue additional debt. The company will issue equity if it decides to make investments that will cause it to exceed some maximum leverage ratio. Myers' model also notes that businesses may depart from their optimal leverage ratio for extended periods of time.

"Summing up past research on what determines corporations' use of leverage, the key factors appear to be taxes, costs of financial distress associated with higher debt, and the costs entailed in the relationship among owners, management, and creditors."

Summing up past research on what determines corporations' use of leverage, the key factors appear to be taxes, costs of financial distress associated with higher debt, and the costs entailed in the relationship among owners, management, and creditors. In addition, optimal leverage is likely to vary across industries, among firms within industries, and even across time for individual firms as changes occur in the tax code, the costs of operation, the investment opportunities available to the firm, and the market for corporate control.

Why Corporations May Be Underleveraged

Ellsworth (1983) contends that U.S. firms are sacrificing international competitiveness because they are underleveraged. He postulates that many firms are underleveraged because managers devote insufficient consideration to their firm's financial strategy. Many businesses let their desire to achieve or maintain a particular credit rating control the resources available for new investments. Ellsworth recommends that firms should re-evaluate their financial practices in light of new investment opportunities.

Another argument consistent with the hypothesis that companies are underleveraged is that management may be more risk-averse than the firm's shareholders. Management may have developed firm-specific human capital that would be lost upon bankruptcy. In contrast, many shareholders own a diversified portfolio of stocks, and the portfolio's value would not be significantly influenced by the failure of any given business. Thus, even if an increase in leverage had a proportionate increase in both the managers' wealth and the value of the company's stock, management may be unwilling to assume additional risk.

Management and shareholder interests might be better aligned if management compensation were tied to the performance of the corporation's common stock; however, this approach has its limits. Common stock prices are influenced by a variety of factors that management cannot control. If managers' compensation depended solely on the firm's stock price, managers would demand compensation for the possibility that factors outside their control would reduce the firm's stock price. In an attempt to forestall these demands, businesses instead typically provide a compensation package to management that includes payments which are independent of the company's stock price.

The other common method of aligning management and shareholders' interest is through the market for corporate control. A firm may be acquired by new managers if a sufficiently large gap exists between the firm's current stock market value and its potential value. Until recently, most takeovers occurred when large companies bought smaller ones. Large firms could increase the leverage of their existing operations to obtain acquisition funds without significantly reducing their credit ratings. However, smaller companies were generally unable

to borrow enough funds to acquire large firms. As a result, sufficiently large businesses were rarely taken over without the approval of the acquired firms' management.

Now, with the development of original issue junk bonds, which are rated "speculative" by the rating agencies, smaller corporations can obtain the funds to acquire large, inefficient businesses and replace their management. Some large corporations have noted this threat and have—by increasing operational efficiency and the firm's debt level—sought to reduce their risk of being taken over. By increasing its debt level, such a firm would become unable to support any further increases in debt, thereby forcing potential acquirers to rely on equity financing. In either case, however, the likelihood that corporations are underleveraged is lower since both the proliferation of junk bonds and the development of counterstrategies tend to raise debt levels.

Why Corporations May Be Overleveraged

The development of the junk bond market may help reduce the concern of people who think corporations are underleveraged, but this development increases the concern of people who think corporations are already overleveraged. The junk bond market provides another mechanism for corporations to increase their debt levels beyond the socially optimal level.

Some care must be taken in analyzing the costs of excessive leverage. Public policymakers need not consider the costs of failure suffered by people positioned to demand compensation for an overleveraged firm's greater risk of bankruptcy. For example, creditors and employees are two parties that are at risk in bankruptcy but who can make a company recognize the costs of its leverage decisions. Creditors, for example, can demand that businesses which present a higher risk of loss or failure pay a higher interest rate. Workers can push for higher wages from financially weak companies or look for alternative employment.

Not all parties, however, are able to influence a company's leverage decisions. Financial weakness in the corporate sector could lead to a cutback in business activity which would weaken the macroeconomy. In his 1933 analysis of the interaction of debt and deflation, Irving Fisher contends that deflation raises the real value of debt and may cause companies to reduce their output and employment. The reduction in output and employment further weakens the economy and leads to corporate failures, which in turn reduce output more and strengthen the forces of deflation.

Jack Guttentag and Richard Herring (1984) provide another mechanism by which corporate weakness could affect the economy as a whole. In their model, investors (banks) are quite good at estimating project-specific risk, but they systematically underestimate the possibility of a major macroeconomic shock. Corporations respond to this systematic error by reducing their capital ratios below those levels they would maintain if the true probability of major shocks were known. When a shock does occur, the value of collateral backing corporate loans declines. Banks respond by rationing, or restricting, credit, which further slows macroeconomic activity.

Concern about corporate bankruptcies because of excessive leverage may also adversely influence monetary policy. The Federal Reserve (1984) "attempts to ensure that growth in money and credit over the long run is sufficient to encourage growth in the economy in line with its potential and with reasonable price stability."[4] This policy objective may occasionally require restraining the growth of money in order to prevent an excessive rate of price inflation. However, the Federal Reserve may be reluctant to follow appropriate anti-inflationary policies if they might cause a wave of corporate bankruptcies that would weaken the economy even more. Furthermore, even if the Federal Reserve is confident that the macroeconomic consequences of a disinflationary policy can be controlled, failing corporations may attempt to exert political pressure on monetary policy.

Another cost of leverage not fully borne by the firm is the expected costs of bankruptcy when a corporation successfully demands a government bailout. The U.S. political system allows companies that have failed to appeal for public support. In almost all cases, nonfinancial firms are denied direct support for continuing operations, but in a few instances the government has provided assistance.

Thus, the effect of excessive corporate debt on government expenditures, the stability of the macroeconomy, and monetary policy all provide reasons for public concern about corporate debt ratios. However, current tax policy provides the exact opposite incentive, favoring debt financing over the use of equity.

Ideally, a theory could help determine the optimal leverage ratio for each corporation, but no such theory has been devised to date. Existing theory is not even sufficiently powerful to allow us to specify the value-maximizing capital level for individual corporations. Expanding the analysis to consider the social costs of leverage only complicates the problem.

Are U.S. Corporations, in Fact, Underleveraged?

The arguments that U.S. corporations are underleveraged are spurred in part by the problems the United States has had in competing in international markets. U.S. firms appear to have lower debt ratios than many of their foreign competitors. Do the higher debt ratios in foreign countries suggest that U.S. businesses are underleveraged?

In comparing domestic leverage ratios with debt levels of West German and Japanese companies, Ellsworth (1985) concludes that U.S. firms are indeed underleveraged. His research indicates that the relative reluctance of domestic firms to use debt financing renders their cost of capital higher, lowering return on equity and reducing their ability to support rapid growth while maintaining a constant capital structure. The suggestion that Japanese corporations have a lower cost of capital is supported by Irwin Friend and Ichiro Tokutsu's (1987) findings. Their analysis also lends credence to the claim that the lower cost of capital resulted in part from the higher leverage ratios of Japanese corporations. One limitation of Friend and Tokutsu's results to the current situation is that they use average data from 1962 to 1984. Even if Japanese firms no longer have a funding cost advantage, Friend and Tokutsu's results could be obtained if Japanese corporations had a sufficiently large advantage in the 1960s and 1970s.

The analysis below considers two counterarguments to the contention that U.S. companies are underleveraged relative to foreign firms, especially those in Japan and West Germany. First, several studies find that, properly measured, U.S. leverage ratios are approximately the same as those in Japan and West Germany. Second, any remaining differences in leverage can be explained by foreign financial systems that discourage firms from issuing equity and encourage them to borrow from banks.

Measuring the Differences in Leverage Ratios. U.S. companies appear to have significantly lower leverage ratios than Japanese and West German firms if the ratios are measured using unadjusted accounting data, but the appearance may be misleading. Ellsworth finds that U.S. corporations have a ratio of total debt to total capital that is approximately one-half that of Japanese and West German firms. C.D. Elston's (1981) research calculates that the equity capital-to-asset ratio of manufacturers in Japan was approximately 21 percent, which compares with 35 percent to 40 percent for those in West Germany and 50 percent to 60 percent for those in the United States. John D. Paulus (1986) compares debt-to-equity ratios for seven arbitrarily selected industries in the United States, West Germany, and Japan.[5] He finds that the book values of the U.S. ratios are the lowest in all but three of fourteen possible cases.

Statistical analysis of leverage ratios confirms simple examination of book data. Ravi Sarathy and Sangit Chatterjee (1984), using 1979 balance sheet data, compare balance sheet ratios for 573 large Japanese firms and 368 large U.S. firms. A simple t-test, which gauges whether differences are merely a chance occurrence, showed that the sample of Japanese businesses has significantly lower equity-to-asset ratios. Allen Michel and Israel Shaked (1985) use a more sophisticated approach to compare a matched sample of 130 Japanese and 130 U.S. firms. Thirteen companies from ten industries in each country were selected, and two tests were used to compare differences in the two countries' capitalization ratios, which the researchers defined as "the ratio of equity to equity plus total debt."[6] Their results further bolster the hypothesis that Japanese firms are more highly leveraged.

W. Carl Kester (1986) conducts an even more sophisticated statistical analysis of U.S. and

Japanese debt ratios, one which takes into consideration the fact that the profitability, risk, growth, and size of a corporation may also influence its use of debt financing. However, even after using regression analysis to adjust for all of these factors, he finds that U.S. firms have significantly lower debt-to-total asset ratios than Japanese corporations when the ratios are calculated with unadjusted accounting data.

Unadjusted accounting data, however, may not paint a true picture in the case of Japanese firms. Elston points out several reasons that book values may understate Japanese equity: (1) Japanese companies probably take more tax-free deductions from earnings (and hence retained earnings) than corporations in other countries, (2) large Japanese corporations tend to provide more trade financing to smaller corporations than is typical in many countries, and (3) the difference between the market value and the book value of the assets of Japanese corporations is probably greater than comparable differences for foreign corporations.[7]

Elston reports official Japanese estimates that the equity-to-assets ratio would have risen from 18 percent to 35 percent in 1967 if these three factors were included in the analysis. As he mentions, unofficial estimates of an adjusted equity-to-assets ratio ranged from 40 percent to 50 percent in 1975. Stephen Bronte (1982) reports that confidential analysis of adjusted leverage ratios by the Japanese Ministry of Finance and the Bank of Japan suggests that Japanese and U.S. firms both have stockholders' equity-to-total liabilities ratios of approximately 2:3. Thus, correcting differences in accounting data may eliminate most of the apparent disparities in leverage ratios across countries.

The problems with adjusting accounting data indicate that analysis of debt ratios using market values might be more appropriate. When Paulus compares the ratios of debt to market values of equity for the same seven industries that he uses for book value comparisons, he finds that the ratios fall dramatically: West Germany drops from 2.33 in book terms to 1.14 using market value of equity; Japan declines from 3.63 to 1.57. The U.S. figures are little changed, rising from 1.22 using book value to 1.25 using market value of equity. Paulus's figures may be somewhat deceptive in that he uses market values for equity but not for debt. His analysis, nevertheless, casts serious doubt on simple comparisons of book values, especially since more sophisticated analysis appears to support his findings regarding market value leverage ratios.

For example, Kester uses regression analysis to control for differences in profitability, risk, growth, and size between U.S. and Japanese firms. He concludes that businesses in these countries have similar market value debt ratios. Michel and Shaked also suggest that the overall market capitalization ratios of Japanese and American corporations appear to be similar.[8] However, they find evidence that the shape of the distributions of capitalization ratios is different.[9] Specifically, Michel and Shaked find that the capitalization ratios of the Japanese sample contain more low-valued ratios than the sample of U.S. firms. Further doubt is cast on discounting ratio comparisons by the fact that the higher accounting leverage ratios have *not* resulted in substantially higher bankruptcy rates for Japanese and West German firms. Although Edward I. Altman (1984) finds that the Japanese failure rate may be somewhat higher than that of U.S. firms, he also notes that "just as we discovered in the comparison of Japanese and U.S.A. rates, the West Germany-U.S.A. ratios are quite similar."[10]

"[C]orrecting differences in accounting data may eliminate most of the apparent disparities in leverage ratios across countries."

Although West German and Japanese companies have leverage ratios comparable to U.S. firms', they also operate in environments which give greater encouragement to debt. West German and Japanese financial markets are thought to be far weaker than the U.S. markets, which are among the most developed in the world. Charles Smith and others (1987) contend that Japanese

corporations continue to avoid issuing all types of securities in Japan because new issues are "so red-tape-tied" by government policies. This bureaucracy has encouraged Japanese firms to rely on bank debt. W. Friedmann, D.H.A. Ingram, and D.K. Miles (1984) also note that West German governmental restrictions discourage small firms from becoming public limited companies—the only type of firm that can raise equity in the share markets. In particular, all public limited companies must allow their employees to nominate at least one-third of their supervisory board members.

West German and Japanese corporations are also encouraged to have higher leverage ratios by financial systems that help reduce conflict between owners and creditors. Japanese and West German firms are able to issue more debt because the agency costs associated with high debt levels are reduced by those nations' financial structures. Banks in Japan and West Germany have historically been allowed to own stock in nonfinancial corporations and participate in the management of companies. Such involvement reduces the incentive to transfer wealth from creditors to owners. Furthermore, when Japanese businesses issue debt to the market, they are generally required to provide collateral. Rene M. Stulz and Herb Johnson (1985) show that collateralized debt further reduces a company's incentive to attempt to transfer wealth to the owners. U.S. banks, in contrast, are severely limited in their ability to purchase the stock of nonfinancial corporations. Also, while U.S. corporations issue some collateralized bonds, Kester notes that a majority of corporate debt is unsecured.

"West German and Japanese corporations are also encouraged to have higher leverage ratios by financial systems that help reduce conflict between owners and creditors."

The Japanese also encourage debt by reducing the costs of financial distress. Many Japanese corporations are members of large industrial groups, or families of corporations, called *keiretsu*, in which stock ownership is concentrated in one or several parents. These groups typically include a major bank that provides most of the necessary banking services to the group.[11] This ownership structure permits temporary financial problems to be met with assistance from other companies within the group. If a company should encounter substantial financial difficulties, its bank will often take the lead in arranging new loans or a merger. If the firm becomes bankrupt, then the bank may subordinate its position to that of other creditors, eliminating the need for lengthy negotiations and reducing legal costs.

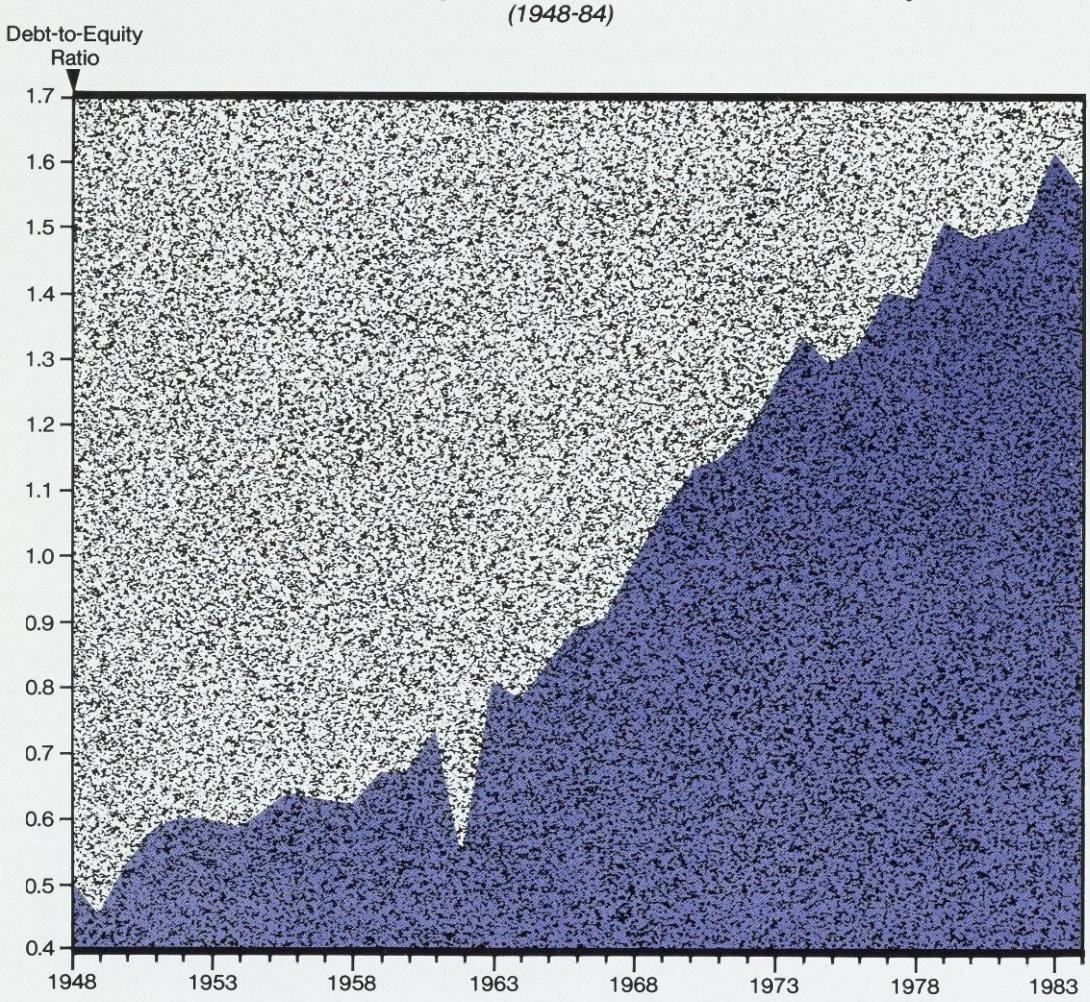
Governmental guarantees can also reduce the costs of financial distress. Japanese commercial banks have borrowed substantial sums from and remained in debt to the Bank of Japan for extended periods of time. The willingness of the Bank of Japan to allow extended borrowings, according to Sadahiko Suzuki and Richard W. Wright (1985), reduces banks' concern about liquidity crises and thus increases bank loans. Elston also suggests that implicit government guarantees have been provided to certain industries targeted for rapid growth.

Thus, corporate leverage ratios in some foreign countries appear higher than those in the United States when measured in book value terms. However, the differences are eliminated when leverage is measured in market value terms. Moreover, some foreign countries have financial systems that are more supportive of debt financing.

Analysis of Domestic Leverage Ratios through Time

Aside from cross-national comparisons, another way of analyzing leverage rates in the absence of theoretical specification of optimal leverage is to compare current levels with those from prior periods. If operating riskiness of corporations is stable over time, an increase in leverage ratios suggests that corporations are

Chart 1.
Book Value Debt-to-Equity Ratios for U.S. Nonfinancial Corporations
(1948-84)



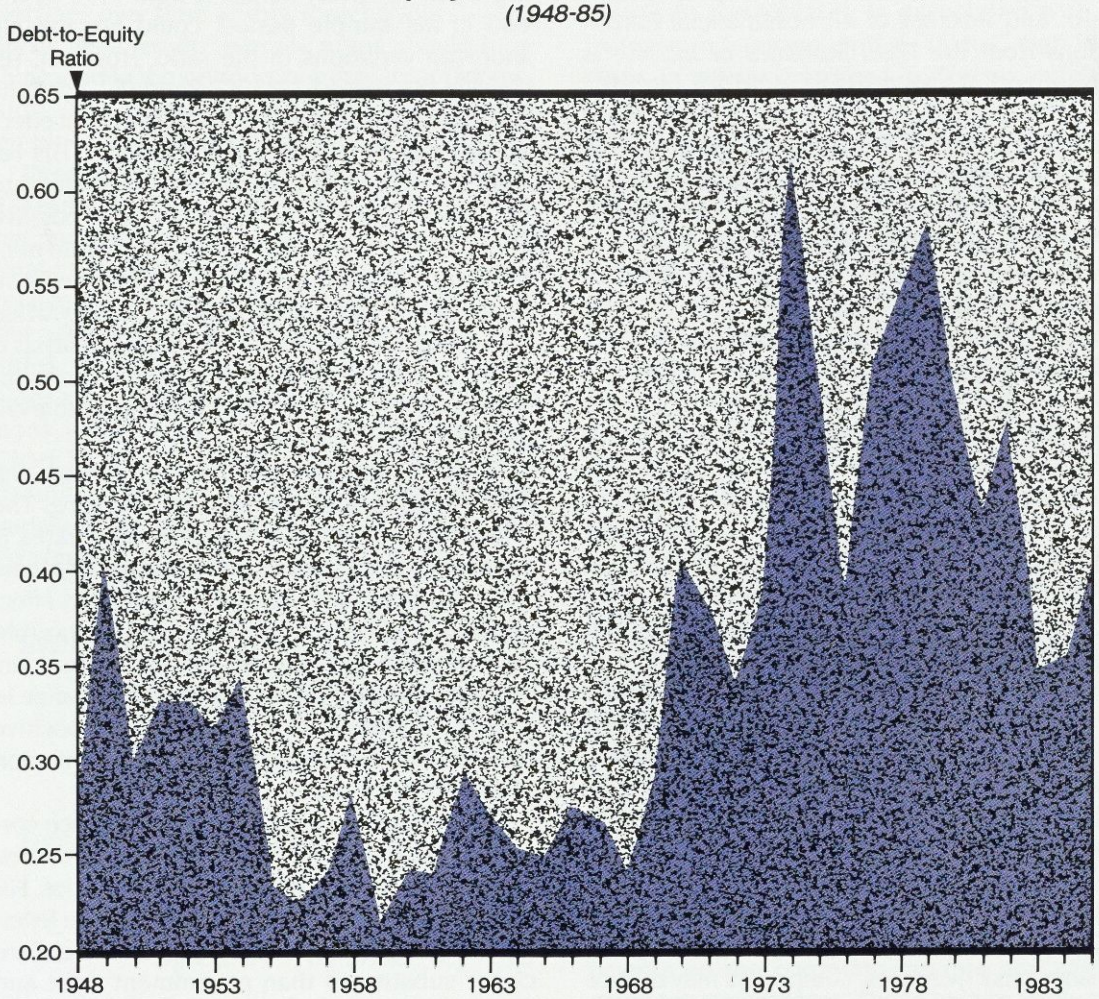
Source: Calculated by the Federal Reserve Bank of Atlanta using data from *Statistics of Income, Corporate Income Tax Returns*, yearly issues, 1948-84, Internal Revenue Service, U.S. Department of the Treasury.

becoming financially weaker, and a decrease implies greater strength.

Historical Trends. Several methods for calculating leverage ratios are available. The strongest case for concern about corporate debt levels arises from the analysis of leverage using book values for debt and equity. Using 1926-79 data from the Internal Revenue Service's *Statistics of Income,* Robert A. Taggart, Jr. (1984) examines the *long-term* debt-to-asset ratio for all nonfinancial U.S. corporations. Chart 1 presents the *total* debt-to-equity ratio from 1948 through 1984 for all nonfinancial U.S. corporations and shows consistent increases in the book value ratio of debt to equity over the post-war period, with a maximum of 1.614 occurring in 1983.[12]

Corporate leverage ratios are less troubling when measured using the market value of debt to the replacement cost of assets as a measure of leverage. Raymond W. Goldsmith and others (1963) examine replacement cost leverage ratios from 1900 to 1958. Their results show that corporations had much higher debt ratios prior to World War II than after that war. George M. von Furstenberg (1977) examines the period from 1952 to 1976 and finds that replacement cost leverage ratios rose between 1955 and 1965 but thereafter remained relatively stable. Roger H.

Chart 2.
Market Value Debt-to-Equity Ratios for U.S. Nonfinancial Corporations
(1948-85)



Source: Calculated by the Federal Reserve Bank of Atlanta using data from *Statistics of Income, Corporation Income Tax Returns*, yearly issues, 1948-85, Internal Revenue Service, U.S. Department of the Treasury; Composite Average of Yields on Industrial Bonds, *Moody's Industrial Manual 1986*, vol. I (A-I); and *Economic Report of the President*, February 1986, Washington, D.C.: U.S. Government Printing Office.

Gordon and Burton G. Malkiel (1981) extend von Furstenberg's calculations to 1978 and determine that replacement cost leverage ratios rose to their highest levels in 1977 and 1978. Paul Bennett and others (1985) examine replacement cost leverage ratios over the period from 1958 to 1984. They find that leverage increased over the period from 1958 to the mid-1960s, fluctuated until 1973, and then plunged. In 1974, the replacement cost leverage ratio fell to the levels of the late 1950s and early 1960s and remained at low levels through 1984. Indeed, the lowest leverage ratios appear to have occurred in 1981.

Debt ratios are also less threatening when leverage is measured by capitalizing dividend and interest payments by corporations at market rates to obtain estimates of the market value of equity and debt. Daniel M. Holland and Stewart C. Myers (1979) use this approach to analyze leverage ratios over the period from 1929 to 1981. They capitalize dividends using the dividend yield on Standard and Poor's Composite Index and capitalize interest payments using Moody's Baa corporate bond rate. Debt-to-equity ratios computed with a modified version of their approach are presented in Chart 2;

dividends of all nonfinancial corporations from the IRS's *Statistics of Income* are capitalized at the rate of the Standard and Poor's 400 dividend yield, and interest of all nonfinancial corporations from the IRS's *Statistics of Income* is capitalized at the average yield for Moody's Industrial Composite Debt Index for each year.[13] Chart 2 shows that the debt-to-equity ratio in 1985 was higher than during the 1960s. However, the 1985 ratio is in the same range as in the early 1950s and early 1970s. Moreover, the 1985 ratio is well below the levels seen in the mid-1970s and early 1980s.

Changes in Leverage and Changes in Risk. Changes in leverage ratios may not always denote changes in risk. Leverage ratios shift over time for a variety of reasons, with different implications for corporate financial conditions. For example, increased leverage resulting from a tax policy that is more favorable toward debt suggests reduced corporate financial strength. In contrast, increased leverage caused by a more stable macroeconomic environment may suggest no change in corporate strength.

Based on the work done on determinants of corporate financing policies, Taggart (1984) delineates several factors that could influence leverage ratios over time: business risk, corporate and personal taxes, inflation, federal government borrowing, and the ratio of internal funds to investment opportunities. Business risk influences leverage through its effect on a corporation's probability of bankruptcy. As business risk increases, companies may reduce their leverage to avoid increased bankruptcy risk. Taggart examines the effect of business risk by comparing changes in corporate debt-to-asset ratios with the variability of returns for the Standard and Poor's composite stock index. He finds that ratios apparently plunged when business risk increased during the Depression and rose with the reduction of risk in the period after World War II.

Corporate and personal taxes influence leverage ratios through their effect on the after-tax cost of debt and equity financing. To explore this relationship, Taggart compares changes in debt-to-asset ratios with a "debt incentive tax ratio," which proxies the relative taxes on debt and equity over the period from 1900 to 1980. A graph of the two ratios implies that they were unrelated, or even inversely related, prior to World War II and only marginally related thereafter. Furthermore, the incentive ratio, which has been relatively constant from 1950 to the end of his sample period, could not explain short-run variations in the ratio. However, reviewing the period 1935-82, Randall J. Pozdena (1987) finds that tax policy has a significant effect on aggregate corporate debt ratios.[14] His results show that the corporate tax rate and rate on capital gains have a significantly positive effect. The personal tax rate and corporate non-debt tax shields have a significantly negative effect on the ratio of liabilities to equity when measured in book terms.[15] Pozdena's analysis is superior both in the variables used to proxy for taxes and the methodology it employs to evaluate the effect of taxes.

Inflation can affect debt ratios by increasing the real tax advantages of debt financing. The inflation premium in nominal interest rates is primarily a return of the real principal of a loan. Thus, an increase in the inflation rate in effect allows a business to deduct from its taxable income more of the real principal of its loan. Taggart's graph of debt ratios and the change in the GNP deflator fails to reveal a close, positive relationship between movements in inflation rates and debt ratios.

Federal government debt can influence corporate leverage by conditioning investors' willingness to absorb corporate debt ratios. For example, government debt may influence leverage ratios if government and corporate debt are closer substitutes than government debt and corporate equities. Taggart finds "a strong inverse relationship" between government debt and corporate debt-to-asset ratios when the two are graphed over time.

The ratio of internal funds generated to investment opportunities may be important in determining corporate debt ratios in the short run. Myers' pecking order implies that firms may depart from their optimal ratios for extended periods of time because of the costs of issuing new securities. However, Taggart does not provide empirical analysis of this effect because the pecking order theory does not suggest permanent deviations of optimal ratios from actual ratios.

Another factor that may influence leverage ratios over time is found in Guttentag and Herring's (1984) contention that firms sys-

tematically underestimate the probability of major shocks to the economy. In their model, individuals' subjective probability of a shock declines over time as they forget about the last shock. As a result, leverage ratios should have increased in the period since the Great Depression. The researchers do not provide any empirical evidence on this hypothesis.

Recent Trends in Corporate Debt Ratios. Taggart's hypotheses, along with that of Guttentag and Herring, can be jointly tested through linear regression analysis. Regression analysis relates the value of one dependent variable to the values of one or more independent variables. In the present study, separate regressions are run for two definitions of leverage: the book value using the same definition as in Chart 1, and the market value using the same definition as in Chart 2. The independent variables are those considered by Taggart and Pozdena:

$$BVDE = a_0 + a_1^{-}*GOVNF + a_2^{+}*INFL + a_3^{-}*RISK + a_4^{+}*CORP + a_5^{-}*INDIV + a_6^{+}*CGAIN + a_7^{-}*SHLD + e_1 \quad (1)$$

$$MVDE = b_0 + b_1^{-}*GOVNF + b_2^{+}*INFL + b_3^{-}*RISK + b_4^{+}*CORP + b_5^{-}*INDIV + b_6^{+}*CGAIN + b_7^{-}*SHLD + e_2, \quad (2)$$

where *BVDE* equals the book value debt-to-equity ratio as described above; *MVDE* represents the market value debt-to-equity ratio as described above; *GOVNF* is the ratio of government debt to total domestic nonfinancial debt; *INFL* is the percent change in the GNP deflator for each year; *RISK* equals the standard deviation of monthly percentage changes in the price for Standard & Poor's Composite Index; *CORP* is the maximum tax rate on corporate income; *INDIV* is the maximum tax rate on the ordinary income of individuals; *CGAIN* equals the maximum tax rate on the capital gains of individuals; *SHLD* is a measure of the non-interest tax shields of corporations, defined as in Pozdena; and e_1 and e_2 are random error terms. Models are estimated using annual data from 1948-84.

The expected signs based on Taggart and Pozdena for each of the coefficients are over the variables. A "plus" sign indicates that an increase in the variable is associated with an increase in leverage, and a "minus" sign indicates an inverse relationship. The tax variables in the model are Pozdena's. The tax incentive variable discussed by Taggart was substituted for the tax variables Pozdena used, but those results are not reported because the coefficient on the tax incentive variable was not significant.

Table 1 presents the results of estimating both models. Each equation is estimated twice because a potential statistical problem called *autocorrelation of the error terms* was indicated by the first estimation. The corrected equations use the maximum likelihood AR1 correction method in the computer package *RATS*.[16] With the exception of the corrected market value equation, all equations are significant at the 99 percent level of confidence, indicating the odds that the same results could have occurred by chance are only 1 in 100. The corrected market value equation was not significant, even at the 95 percent level.

The results of the book value of debt-to-equity estimation are not substantially changed by the correction. In both models, the coefficients on the ratio of government to total nonfinancial debt, corporate risk, inflation, and individual taxes are significant with the correct sign. The coefficient on the tax shield variable is significant with the wrong sign, and the coefficients on the corporate tax rate and capital gains are insignificant. These results imply that government debt tends to crowd out corporate debt issues, that corporations reduce their leverage as their risk increases, and increases in the inflation rate are associated with an increase in leverage ratios measured in book terms. This set of results does not appear to suggest that taxes have a significant effect on corporate debt ratios. However, this study uses a shorter sample period, with less variability in tax rates than does Pozdena.

The results of estimating the market value equation imply that none of the variables can explain movements in debt-to-equity ratios measured in market terms, perhaps because of the difficulty in measuring the market values of debt and equity. This outcome could also be obtained if changes in the ratio were due primar-

Table 1.
Regression Model Estimates Debt to Equity without the Trend Variable†
(Annual Data, 1948-84)

	Book Value	Book Value with AR1 Correction	Market Value	Market Value with AR1 Correction
GOVNF	-0.7057*	-0.7606*	0.2678	0.0960
	(-2.93)	(-2.90)	(0.95)	(0.25)
INFL	0.0241*	0.0222*	0.0152	0.0045
	(3.33)	(2.75)	(1.81)	(0.51)
RISK	-4.5074*	-4.3858*	-0.0483	0.7099
	(-4.26)	(-4.18)	(-0.04)	(0.67)
CORP	0.0951	0.0388	-0.1210	-0.1852
	(0.23)	(0.08)	(-0.25)	(-0.30)
INDIV	-0.6255*	-0.6035*	-0.1102	-0.1985
	(-2.81)	(-2.55)	(-0.42)	(-0.63)
CGAIN	-0.1356	-0.1404	0.5483	0.5985
	(-0.41)	(-0.38)	(1.41)	(1.12)
SHLD	-2.1376*	-2.1333*	-0.4629	-0.3309
	(-7.84)	(-7.40)	(-1.46)	(-0.85)
Constant	3.3134*	3.3408*	0.5572	0.6110
	(13.09)	(12.43)	(1.89)	(1.67)
rho		0.1010		0.4186*
		(0.4643)		(2.15)
F-STAT (7,29)	172.9*	137.8*	6.756*	2.170
R-Square	0.977	0.977	0.620	0.647
Durbin-Watson	1.80		1.57	

† *t-statistics in parentheses*

* *Indicates significance at the 95 percent level (two-tailed for t-statistics)*

ily to changes in the market value of equity that are not expected by corporate managers.

As Guttentag and Herring contend, corporations' willingness to assume debt may have increased over this time period. A simple way of testing this hypothesis is to add a time trend variable to the models. If corporations are willing to assume more debt as memories of the Depression fade, then the coefficient on the time trend should be positive. The revised models simply add a trend variable, *TREND,* to equations (1) and (2). *TREND* represents a time trend which begins with a value of one in 1948, increases by one per year, and has an expected coefficient value greater than zero. The expected signs of each of the coefficients are the same as before. The results of estimating the subsequent equations are presented in Table 2. Autocorrelation of the residuals may be rejected at the 95 percent level in the book value equation but not for the market value equation. Thus, the market value equation is also estimated using a correction. All equations are significant at the 95 percent confidence level.

The coefficient on the trend variable is significantly positive in the book value equation, suggesting that corporate debt ratios have risen through time. The coefficients on the risk and inflation variables are also significant with the correct sign. The coefficient on the ratio of government debt to total nonfinancial debt changed signs and is significantly greater than zero. This ratio is highly correlated with the trend variable and apparently is serving as a

proxy for the trend variable in Table 1. All of the tax variables in Table 2 have the correct sign, and the coefficients on the individual tax rate and capital gains rate are significant. Overall, these results are more supportive of the tax hypotheses than those in Table 1.

The correction does not significantly affect the results of the market value debt-to-equity ratios in Table 2. Three variables have significant coefficients in the market value of the debt-to-equity model, the ratio of government debt to total nonfinancial debt, the trend variable, and the tax rate on capital gains. The coefficient on the ratio of government to total nonfinancial debt has the wrong sign, but the coefficients on the trend variable and on the capital gains variable have the correct signs. These results are less strong than those for the book value ratios, perhaps because of the difficulties in measuring market values or perhaps because managers, failing to predict changes in market value or regarding the changes as transitory, do not fully adjust to changes in market values.

Overall, the analysis of the determinants of domestic leverage ratios over time supports the hypothesis that debt-to-equity ratios are increasing as managers forget the difficulties of the Depression. The results also suggest that debt-to-equity ratios measured in book terms are a positive function of inflation rates and a negative function of the riskiness of corporations. Some support is also provided for the hypothesis that taxes have had a significant effect on corporate debt-to-equity ratios, especially when they are measured in book terms.

Summary. Corporate leverage ratios are somewhat higher than they have been during certain prior periods. When leverage is measured in book value terms, the increase in leverage is disturbing. However, if leverage is measured in replacement cost or market value terms, then current debt ratios do not appear to be unusually high. Regression analysis supports the belief that leverage ratios measured in book and market value terms are positively related to a time trend. Leverage ratios measured in book terms are positively related to the inflation rate and negatively related to the amount of risk corporations are willing to assume. Some support is also found for theories which contend that taxes have a significant effect on corporate leverage.

Table 2.
Regression Model Estimates
Debt to Equity
with the Trend Variable†
(Annual Data, 1948-84)

	Book Value	Market Value	Market Value with AR1 Correction
GOVNF	0.9371*	1.4151*	1.4402*
	(2.63)	(2.67)	(2.73)
INFL	0.0197*	0.0121	0.0126
	(3.74)	(1.54)	(1.5)
RISK	-2.3617*	1.4502	1.4506
	(-2.74)	(1.13)	(1.12)
CORP	0.1507	-0.0821	-0.0861
	(0.50)	(-0.18)	(-0.20)
INDIV	-0.3918*	0.0530	0.0617
	(-2.36)	(0.21)	(0.25)
CGAIN	0.6986*	1.1309*	1.1357*
	(-2.43)	(2.64)	(2.69)
SHLD	-0.5628	0.6369	0.6581
	(-1.58)	(1.20)	(1.23)
TREND	0.0297*	0.0207*	0.0211*
	(5.29)	(2.48)	(2.53)
Constant	0.6096	-1.3310	-1.3698
	(1.12)	(-1.64)	(-1.69)
rho			-0.3386
			(-0.16)
F-STAT	295.5*	7.72*	8.17*
R-Square	0.988	0.688	0.688
Durbin-Watson	2.33	1.94	

† *t-statistics in parentheses*

* *Indicates significance at the 95 percent level (two-tailed for t-statistics)*

The positive relationship between leverage ratios and the time trend is the most troubling result because of its implication that corporations may be weakening their financial structure as memories of the Depression fade. However, the trend variable may be subject to multiple interpretations since a number of potential leverage determinants that are not modeled, such as technology, may be correlated with the time trend.

Conclusion and Policy Implications

The results of this study of debt-to-equity ratios of nonfinancial corporations in the United States suggest that a variety of factors may influence corporate leverage ratios and that theory is not yet able to identify optimal ratios, either for individual corporations or for nonfinancial corporations in the aggregate. Leverage ratios appear to be somewhat higher than they have been in the past, but they are unusually high only when measured using the least reliable indicator, book value. However, regression analysis controlling for the influence of certain other factors indicates that U.S. corporations have tended to increase their leverage during the post-war period.

Some studies suggest that U.S. corporations are underleveraged relative to their foreign competitors, but others contend that when leverage is measured using market values, the differences are insignificant. Regardless of relative leverage ratios, foreign countries do not have significantly higher failure rates than the United States. Moreover, the market structure, tax policy, and regulation in some foreign countries tend to provide more support for high debt levels than in the United States. One policy implication of such cross-national comparisons concerns banking and is discussed in the accompanying box.

The results of this study are limited in at least two important ways. First, most of the analysis focuses on aggregate debt ratios of the entire corporate sector, whereas, for many purposes, the debt ratios of individual corporations are important.[17] Second, the empirical examination of domestic leverage ratios is constrained by available data to the period prior to 1984, although market value debt-to-equity ratios are presented for 1985. This study does not consider any changes in leverage after 1985.

Overall, the results do not reinforce the contention that U.S. firms are underleveraged and provide only weak support for the argument that U.S. firms are overleveraged.

Would Relaxing the Line between Banking and Nonfinancial Companies Help Firms Support More Debt?

The experience of corporations headquartered in foreign countries could be seen as encouragement for the United States to remove restrictions on banks' affiliation with nonfinancial corporations. Bank ownership of stock may help reduce the agency costs of debt financing and reduce the costs of distress when a firm encounters financial problems. Thus, bank ownership could promote efficient management and allow some businesses to operate with higher debt levels.

However, bank ownership of the stock of nonfinancial corporations raises a variety of issues in addition to the effect of such ownership on nonfinancial firms' financial policy. The United States has restricted bank ownership of nonfinancial corporations for a variety of reasons including (1) possible conflicts of interest at commercial banks, (2) the potential for overconcentration in banks of economic and political power, and (3) the desire to avoid extension of the federal safety net, intended to protect banks, to nonfinancial corporations.

Bank ownership of corporate stock is being reevaluated in Japan and West Germany. The Japanese are moving to restrict the ownership ties between banks and other corporations by requiring a reduction in bank ownership of other corporations to 5 percent. In West Germany, commercial bank ownership of nonbank companies has been criticized, though a commission established to investigate this issue found most of the criticisms unsubstantiated.[1]

Relaxing U.S. restrictions on bank stock ownership may also fail to produce higher leverage ratios here. Japanese and West German companies do not have significantly higher debt ratios when market values, rather than book values, are used. Major U.S. corporations have been steadily reducing their reliance on commercial bank loans, partly because the information advantage that banks once held has been eroded and partly because regulatory restrictions such as reserve requirements raise the relative cost of bank loans. Merely relaxing the restrictions on banks' ownership of nonfinancial corporations' stock is unlikely to reverse this trend.

Moreover, Japanese corporations appear also to be reducing their reliance on bank debt. Charles Smith and others (1987) report that while bank lending accounted for an average 84 percent of corporate financing in 1970-74, the average slipped to 60 percent between 1980 and 1984 and in 1984 dropped to 44 percent. In contrast, equity accounted for 36 percent of financing in 1985, approximately double its share in the 1970s. W. Carl Kester (1986) suggests that the reduction in bank lending may be occurring because more of the growth in Japanese corporations is concentrated in firms that are not *keiretsu* members. He also implies that the change in financing policy may be an attempt by Japanese managers to maximize their own utility rather than shareholder value. In particular, Kester notes that heavy debt burdens impose tight controls that managers may wish to avoid. Smith and others provide a different justification for the change in financial policy, noting a Bank of Japan study which states that the diversification of funding sources may have cut the cost of raising funds from 6.4 percent in 1980 to 6.2 percent in 1985.

Thus, bank affiliation with nonfinancial corporations may not provide significant advantages to the nonfinancial sector.[2] Corporations in the United States are moving toward market-based financing and reducing their reliance on banks. Relaxing U.S. restrictions on bank affiliation with nonbanks may not reverse the current trend.

Notes

[1]See Krummel (1980).

[2]Nash (1987) discusses arguments suggesting that the mixing of banking and commerce would produce significant advantages for the commercial banking system. The issues raised in that report are beyond the scope of this study.

Notes

[1]A corporation's reliance on debt financing is typically measured as the percentage of funds obtained through debt. Firms that rely heavily on debt may be said to have a high *debt-to-equity* ratio or a high *debt-to-total asset* ratio or a low *equity-to-asset* ratio. Firms with high debt levels are also said to have *high financial leverage*. This study will refer to all three ratios and the term *financial leverage* in discussing debt levels.

[2]For example, suppose a firm issues debt and uses the proceeds to repurchase part of its outstanding equity. This issuance and repurchase would increase the firm's total interest payments to creditors and reduce the earnings available for dividends.

[3]See Haugen and Senbet (1978, 1988) for analysis suggesting that bankruptcy costs are irrelevant to corporate leverage decisions.

[4]See the Board of Governors of the Federal Reserve System (1984): 1.

[5]The seven industries are chemicals, steel, data processing, electrical and electronics, machinery and engineering, automobiles, and airlines.

[6]The Mann-Whitney U test and the Kolmogorov-Smirnov Two-Sample test.

[7]The discrepancy between book and market values is especially great for land values. A Japanese index of industrial land prices rose from 100 in 1955 to 3,288 in March 1981; see Elston (1981): 515.

[8]Market capitalization ratios were tested for the period 1977-81 using the nonparametric Mann-Whitney U tests.

[9]The Kolmogorov-Smirnov Two-Sample test.

[10]See Altman (1984): 177.

[11]However, companies belonging to groups tend to borrow only approximately 20 percent of their total needs at the group's bank.

[12]Adding to the concern about book value leverage ratios are Tetlow's (1986) findings that Canadian book value leverage ratios declined after 1982.

[13]The S&P 400 Index was chosen to isolate the behavior of industrial dividends from those of financial, utility, and transportation firms.

[14]Pozdena also examines the relative issuance of debt and equity and the issuance of junk bonds over the period from 1908 to 1985.

[15]The only independent variable in Pozdena's model that is not tax-related is the inflation rate. The nondebt-related tax shields include the depletion and depreciation allowances and the investment tax credit. According to DeAngelo and Masulis, these are tax shields that may be lost or reduced in value if the firm has excessive leverage.

[16]The Durbin-Watson statistic for both equations is in the inconclusive range.

[17]See Titman and Wessels (1988) for a recent examination of cross-sectional differences in corporate leverage.

References

Altman, Edward I. "The Success of Business Failure Prediction Models." *Journal of Banking and Finance* 8 (1984): 171-98.

Baxter, Nevins. "Leverage, Risk of Ruin and the Cost of Capital." *Journal of Finance* 22 (1967): 395-404.

Bennett, Paul, Anne de Melogue, and Andrew Silver. "Corporate Debt-Equity Ratios." Federal Reserve Bank of New York *Quarterly Review* 10 (Summer 1985): 46-48.

Board of Governors of the Federal Reserve System. *Federal Reserve System: Purposes and Functions.* Washington, D.C.: 1984.

Bronte, Stephen. *Japanese Finance: Markets and Institutions.* London: Euromoney Publications, 1982.

DeAngelo, Harry, and Ronald W. Masulis. "Optimal Capital Structure Under Corporate and Personal Taxation." *Journal of Financial Economics* 8 (March 1980): 3-29.

Ellsworth, Richard R. "Subordinate Financial Policy to Corporate Strategy." *Harvard Business Review* 61 (November-December 1983): 170-82.

_____. "Capital Markets and Competitive Decline." *Harvard Business Review* 63 (September-October 1985): 171-83.

Elston, C.D. "The Financing of Japanese Industry." *Bank of England Quarterly Bulletin* 21 (December 1981): 510-18.

Fisher, Irving. "The Debt-Deflation Theory of Great Depression." *Econometrica* 1 (1933): 337-57.

Fons, Jerome S., and William P. Osterberg. "Disinflation, Equity Valuation, and Investor Rationality." Federal Reserve Bank of Cleveland *Economic Review* (Fourth Quarter 1986): 2-10.

Friedmann, W., D.H.A. Ingram, and D.K. Miles. "Business Finance in the United Kingdom and Germany." *Bank of England Quarterly Bulletin* 24 (September 1984): 368-75.

Friend, Irwin, and Ichiro Tokutsu. "The Cost of Capital To Corporations in Japan and the U.S.A." *Journal of Banking and Finance* 11 (June 1987): 313-27.

Goldsmith, Raymond W., Richard E. Lipsey, and Morris Mendelson. *Studies in the National Balance Sheet of the United States.* Princeton: Princeton University Press, 1963.

Gordon, Roger H., and Burton G. Malkiel. "Corporation Finance." In *How Taxes Affect Economic Behavior,* edited by H.J. Aaron and J.A. Pechman. Washington, D.C.: The Brookings Institution, 1981.

Guttentag, Jack, and Richard Herring. "Credit Rationing and Financial Disorder." *Journal of Finance* 39 (December 1984): 1359-82.

Haugen, Robert A., and Lemma W. Senbet. "The Insignif-

icance of Bankruptcy Costs to the Theory of Optimal Capital Structure." *Journal of Finance* 33 (May 1978): 383-93.

_____, and _____. "Bankruptcy and Agency Costs: Their Significance to the Theory of Optimal Capital Structure." *Journal of Financial and Quantitative Analysis* 23 (March 1988): 27-38.

Holland, Daniel M., and Stewart C. Myers. "Trends in Corporate Profitability and Capital Costs." In *The Nation's Capital Needs: Three Studies,* edited by Robert Lindsay. New York: Committee for Economic Development, 1979.

Jensen, Michael C. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review* 76 (May 1986): 323-29.

_____, and William H. Meckling. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics* 3 (1976): 305-60.

Kaufman, Henry. "Heavy Debt Poses Threat to Economic and Financial Stability." *American Banker* 151 (September 22, 1986): 12, 13, 15, 16, 34, 43.

Kester, W. Carl. "Capital and Owner Structure: A Comparison of United States and Japanese Manufacturing Corporations." *Financial Management* 15 (Spring 1986): 5-16.

Krummel, Hans-Jacob. "German Universal Banking Scrutinized." *Journal of Banking and Finance* 4 (1980): 43.

Long, Michael S., and Ileen B. Malitz. "Investment Patterns and Financial Leverage." In *Corporate Capital Structures in the United States,* edited by Benjamin Friedman. Chicago: University of Chicago Press, 1985.

Michel, Allen, and Israel Shaked. "Japanese Leverage: Myth or Reality?" *Financial Analysts Journal* 41 (July-August 1985): 61-67.

Miller, Merton H. "Debt and Taxes." *Journal of Finance* 32 (1977): 261-76.

Modigliani, Franco, and Merton H. Miller. "The Cost of Capital, Corporation Finance, and the Theory of Investment." *The American Economic Review* 48 (June 1958): 261-97.

_____, and _____. "Corporate Income Taxes and the Cost of Capital: A Correction." *American Economic Review* 53 (June 1963): 433-43.

Myers, Stewart C. "Determinants of Corporate Borrowing." *Journal of Financial Economics* 5 (1977): 147-75.

_____. "The Capital Structure Puzzle." *Journal of Finance* 39 (July 1984): 575-92.

Nash, Nathaniel C. "Treasury Now Favors Creation of Huge Banks." *New York Times,* June 1987, 1, 14.

Paulus, John D. "Corporate Restructuring, 'Junk,' and Leverage: Too Much or Too Little?" Morgan Stanley *Economic Perspectives* (March 1986): 1-21.

Pozdena, Randall Johnston. "Tax Policy and Corporate Capital Structure." Federal Reserve Bank of San Francisco *Economic Review* (Fall 1987): 37-51.

Sarathy, Ravi, and Sangit Chatterjee. "The Divergence of Japanese and U.S. Corporate Financial Structure." *Journal of International Business Studies* 15 (Winter 1984): 75-89.

Smith, Charles, Bruce Roscoe, Richard Hanson, Brian Robins, and Daryl Gibson. "Japan Banking and Finance." *Far Eastern Economic Review* 136 (April 9, 1987): 54, 63, 86.

Stulz, Rene M. and Herb Johnson. "An Analysis of Secured Debt." *Journal of Financial Economics* 14 (December 1985): 501-21.

Suzuki, Sadahiko, and Richard W. Wright. "Financial Structure and Bankruptcy Risk in Japanese Companies." *Journal of International Business Studies* 16 (Spring 1985): 97-110.

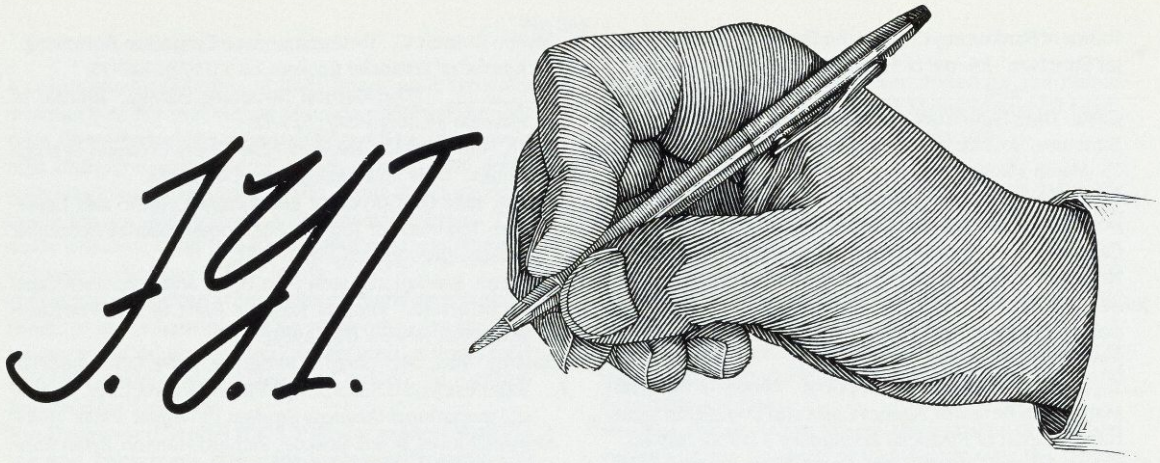
Taggart, Robert A., Jr. "Have U.S. Corporations Grown Financially Weak?" National Bureau of Economic Research Working Paper no. 1523 (December 1984).

Tetlow, Robert. "Some Developments in Financing and Capitalization of Non-financial Business in Canada." *Bank of Canada Review* (December 1986): 3-23.

Titman, Sheridan, and Roberto Wessels. "The Determinants of Capital Structure Choice." *Journal of Finance* 43 (March 1988): 1-19.

von Furstenberg, George M. "Corporate Investment: Does Market Valuation Matter in the Aggregate?" *Brookings Papers on Economic Activity* 2 (1977): 347-97.

Warner, Jerold B. "Bankruptcy Costs: Some Evidence." *Journal of Finance* 32 (1977): 337-47.



The Southeastern Forest Industry after the Tax Reform Act of 1986

W. Gene Wilson

Forestry is a major economic activity in the Southeast, and its potential importance is even greater because of the future expansion possibilities, especially in the pulp and paper segment of the industry. In recent years the forest industry has been subject to many new forces that affect its future development. Particularly important among these forces are the 1986 Tax Reform Act, the Conservation Reserve Program, and the behavior of the dollar. This article considers the performance of the southeastern forest industry in the wake of the new tax provisions.

Like most new tax legislation, the Tax Reform Act of 1986 led to fears about its potential negative impacts, particularly in capital-intensive industries—such as forestry—that are dependent on a resource produced over several years. Changes in capital gains taxation were considered especially important to the forest industry because of the possible impact on tree planting and reforestation and, in turn, on the supply of pulpwood and lumber. Another concern was that the loss of the investment tax credit would make the cost of investing in the industry more expensive and thus possibly reduce capital expenditures. In view of the fact that the declining dollar and the recently imposed Canadian export tax on lumber have strengthened demand for U.S. forestry products, supply constraints could bode ill for prices.

To foresters' relief, the final form of the 1986 Tax Reform Act and business conditions since 1986 have tended to lessen the original apprehensiveness. As booming domestic and export markets pushed the pulp and paper industry to near-capacity production and rendered the lumber market robust as well, substantial new investment in mills and related processing facilities has been occurring. While it cannot yet be determined if tree plantings by private owners have declined, the creation of the Conservation Reserve Program will apparently help to offset any drop. In addition, the tax reform legislation itself has so far proved much less formidable than had perhaps been expected. However, these factors have not guaranteed future success for foresters. Before examining the forest industry, though, an explanation of its structure and economic impact, particularly in the Southeast, might be helpful.

The author is an assistant economist in the regional section of the Atlanta Fed's Research Department.

Structure of the Forest Industry

The forest industry is composed of a wide variety of companies that make products ranging from lumber and wafer board to pulp for making paper. Essentially this industry can be divided into two sections: *forest products,* which consists of pulp, paperboard, paper, and similar products; and *wood products,* which includes lumber, plywood, and other building products.

Forest Products. The term *forest products* refers basically to pulp. Whether derived from wood or other materials such as wastepaper or used rags, pulp is the material from which paper and related products are made. The pulp, paper, and board industry is composed of approximately 6,500 establishments and employs roughly 670,000 people nationwide. For the entire industry, total sales are estimated at $75 billion.

Pulp and paper production has become increasingly concentrated in the South near abundant reserves of southern pine, which bears the long fibers preferred for making heavy duty paper and board. As a result, more than 50 percent of U.S. pulp and paper production now occurs south of the Mason-Dixon line, continuing an industry relocation that has been underway for several years and for various reasons. The South's large supply of commercial forestland and more rapid tree growth certainly are two major factors. Also influencing the trend have been lower costs for labor and resources and an infrastructure suited to forest industries.

In 1987, total wood pulp production in the United States reached an estimated 60 million tons, some 85 percent of which is consumed by the forest industry in making paper (see Table 1). Pulp production is directly linked to the demand for paper products. For paper companies, increased exports and higher domestic demand made 1987 an outstanding year. The production capacity utilization of paper and paperboard manufacturers approached 96 percent, and paper profits surged.[1] The forest products industry earned a record $4.6 billion on paper operations last year as production of paper and paperboard rose 4.5 percent from 1986.[2] This year production of paper and paperboard may set another record as a weaker dollar, greater paper consumption, and energy prices, still well below levels of a few years ago, continue to improve prospects.

In addition to strong domestic demand for pulp and paper, the dollar's depreciation augurs well for pulp and paper exports, particularly to Japan, which absorbs one-fifth of the U.S. pulp sold abroad, and to West Germany. Japan, West Germany, Mexico, and South Korea together receive half of U.S. pulp exports. The potential for increased U.S. export of pulp may also improve as various countries—for example, Taiwan—expand their paper industries.

However, whether U.S. producers can effectively compete with expanding production from a number of countries, primarily in Latin America, remains to be seen. Notwithstanding the dollar's substantial decline over the past three years, the U.S. pulp and paper industry is facing intense global competitive pressures, largely from countries whose currencies have appreciated relatively little vis-a-vis the dollar. Finland, the leading force in process technology, is making progress in reducing energy, labor, and chemical inputs per ton of paper produced.

Table 1.
Pulpwood Production
(billion cubic feet)

	U.S.	South*	
	Volume	Volume	Percent of U.S.
1950	2.7	1.6	59
1955	4.0	2.4	60
1960	5.1	3.0	59
1965	6.7	3.9	58
1970	9.0	5.4	60
1975	8.8	5.4	61
1980	11.3	7.0	62
1983	11.3	7.2	64
1986	11.7	7.9	68
1987	12.0	8.3	69

** South includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.*

Source: *Pulpwood Statistics,* American Pulpwood Association, June 1986. Data for 1986 and 1987 were provided directly by the American Pulpwood Association.

Canada, one of the lowest cost producers, is gaining market share against almost all competitors. Brazil, a long-term strategic threat, is increasing exports at about 40 percent a year, albeit from a small base, whereas the industry worldwide is growing at an average rate of 1.5 percent per year.

Lumber and Related Products. Demand for wood products used in construction rose 6 percent last year as both lumber and plywood sales flourished. Roughly one-third of this country's lumber output is produced in the South. From 1975 to 1987, southern pine lumber production almost doubled, rising from 600 million cubic feet to approximately 1 billion cubic feet. The value of annual production at recent prices is over $2 billion for southeastern timber owners.

Industries involved in producing wood products for construction have not generally enjoyed the prosperity of forest product industries. Following a substantial recovery in 1983, conditions deteriorated in 1984 and 1985. The industry just returned to profitability in 1987. The mixed conditions in the lumber industry result from fluctuating housing demand in the United States, the export-dampening effects of the high value of the dollar in 1984 and 1985, and increased competition from Canadian imports. Last year, though, the cheaper dollar, ample demand from builders, and the effect of Canada's export tariff on relative lumber prices helped to create a prosperous year for U.S. producers.

This recent prosperity must be viewed in context, though. Improved technology, along with import competition, created a surfeit of lumber earlier in this decade. Consequently a substantial amount of industry restructuring has occurred. In particular, a significant amount of productive sawmill capacity has been discontinued.

U.S. lumber and logs should continue to be competitive in world markets owing to the lower dollar. Domestic prospects for lumber are somewhat dimmer, though, as residential construction has decelerated from its pace earlier in the expansion. Although the remodeling market is consuming larger amounts of lumber than previously, that market is closely related to current economic conditions and can change course quickly. It is also much smaller than the market for new homes, apartments, and condominiums.

Forestry in the South

The Southeast is a major manufacturer of pulp and paper. Georgia leads the nation in production of pulp, paper, and pulpwood, while Alabama is a close second in pulpwood output. With many paper mills capitalized at nearly $500 million and sawmills at $1 million to $25 million, Georgia's 16 paper mills and 250 sawmills represent a major industry investment. In recent years, Georgia and Alabama have supplied about one-third of the approximately 7 billion cubic feet of pulpwood annually produced in the Southeast. Moreover, some industry sources indicate that room for expansion still exists throughout the region. Indeed, one study concluded that expansion of forest industries in Alabama could create more economic growth than comparable expansion anywhere else in the state's manufacturing sector.[3]

Southeastern forests seem a likely source for the nation's future pulpwood needs. In the 1960s, in a major industry shift to the Southeast, roughly 2 million acres were purchased for the purpose of growing trees. In the last decade, southeastern forest industries continued to add approximately one-quarter million acres to their land holdings. As a region, the South possesses more commercial forestland than any other area in the country, though a greater share of commercial forestland in the Southeast is owned by nonindustrial private owners.

Because of substantial demand for wood products, southeastern foresters are constantly investing in reforestation and searching for ways to improve productivity. In recent years, however, the future timber supply of the Southeast and the nation has become a constant concern. In this context, it is important to consider whether the 1986 Tax Reform Act provides disincentives for investment in the future of the forest industry.

The Tax Reform Act of 1986 and Its Impact on the Forest Industry

The Tax Reform Act of 1986 is a highly complex piece of legislation that made numerous changes

in then-existing tax laws. The law was intended to simplify the tax code and make it more efficient while being revenue-neutral. Major areas of interest in the act are: (1) individual and corporate tax rates, (2) the investment tax credit, (3) treatment of capital gains, and (4) deductions for various development costs. With regard to the forest industry, most tax changes fell into two separate categories: changes that affected commercial producers such as paper companies and lumber manufacturers, and, perhaps more important, changes that impacted the suppliers of timber—largely non-industrial private owners.

The tax law change that will probably have the greatest effect on timber supply, the basic resource of the forest industry, is the elimination of preferential treatment for capital gains. The proceeds from the sale of or the value of cut timber will no longer qualify for the long-term capital gains deduction, that is, the exclusion of 60 percent of capital gains from taxation. As a result, the income the owner receives from selling timber is now taxed as ordinary income. Prior to the change, timber revenue of sole proprietors could be taxed at no higher than the maximum effective rate of 20 percent (40 percent taxable gain times 50 percent maximum tax rate). For instance, under the old law, a timber owner who earned $10,000 from timber sales could have excluded 60 percent ($6,000) from taxation as a long-term capital gain. The remaining 40 percent ($4,000) would be taxed at the appropriate tax rate for the owner's income tax bracket. Assuming the maximum tax bracket of 50 percent, the tax obligation would have been $2,000 (50 percent of $4,000). Consequently, the effective tax rate on all timber revenue earned was at most 20 percent.

The tax act's effect on individuals is relatively modest. With the new law, capital gains tax rates for individuals now match ordinary income tax rates with a cap of 28 percent. Using the previous example, at the maximum rate of 28 percent, the tax obligation on $10,000 of timber revenue would be $2,800. (Of course, for those individuals in still lower income tax brackets, the effective rate would also be lower.) This change essentially raises the overall tax burden and lowers the after-tax returns from investing in timber. The effect, however, will vary relative to each person's circumstances. At least partially offsetting the impact of changes in capital gains taxation, moreover, are increases in exemptions and the standard deduction.

The impact of the 1986 Tax Reform Act on corporations might be greater. Under the old law, a corporation earning $100,000 from timber revenue could also exclude 60 percent or $60,000 from taxation. The remaining 40 percent would be taxed at a rate of 28 percent, generating a tax obligation of $11,200. Under the new law, the entire $100,000 would be taxed at a rate of 28 percent, creating taxes of $28,000.

While the change in the capital gains tax is of the greatest interest and possibly has the most effect on foresters, another area of concern during development of the new tax legislation was the investment tax credit. Though this credit was eliminated for general business investment, the Act in its final form left unchanged the investment tax credit for timber investment. The impact is thus confined to industrial investment in paper mills and other manufacturing facilities.

Even here, however, the loss of the investment tax credit seems far from dramatic. Indeed, despite the absence of the investment tax credit, papermakers are likely to add capacity at a faster rate over the next three years than they did over the past ten. In 1988, capital spending is expected to increase 25 percent as prospects remain favorable for the industry.[4] The conclusion can be drawn that, while tax policy can influence industries, overall business conditions remain the final influence on investment.

Costs associated with growing timber continue to be deductible just as they were before passage of the 1986 Tax Reform Act. Timber is excepted from the requirement that costs be capitalized. In addition, the provision allowing taxpayers to amortize reforestation expenditures over a period of 84 months was not changed by the 1986 act. This provision remains applicable to not more than $10,000 of expenditures in any year.

Aside from the limited nature of tax reform vis-a-vis the forest products industry, the impact of tax changes may be at least partially offset by various other considerations. For instance, the weight that timber owners give to changes in tax laws may be tempered by the frequency of change in such laws. Tax laws commonly undergo substantial alteration over a period of three

or four years. Thus, people who are concerned about a product that will not be harvested for at least 15 years can be reasonably certain that tax regulations will change more than once between planting and harvest. The possibility of future, more favorable changes, may further mitigate the Act's negative effects.

The Conservation Reserve Program

Is there potential for greatly increasing the productivity of forestland and consequently raising total after-tax revenue despite higher taxation? For most Georgia timber owners, improving forest management would be one of the most profitable investments available.[5] Timber production on unmanaged acreage is expected to yield only about 40 percent of what could be achieved with intensive land management.

One possibly important factor in offsetting future timber shortages is the recent development of the Conservation Reserve Program, which could serve to increase the supply of forests in the South. Under this program, landowners receive an annual payment for idling farm land on a long-term basis. At present, over 5 million acres nationally have been accepted into the program; the goal over the next few years is to engage 40 million acres in the Conservation Reserve Program. While not all the acreage will be planted in trees (grass is the other option), 90 percent of Georgia's farmers enrolled in the program prefer trees. Perhaps as much as 75 percent of the trees planted in this program will be in southern states. The greater interest in trees in the South reflects the marginal productivity for crop production of much of the idled acreage, the faster growing cycle for trees in the South, and the existence of industries with substantial demand for timber.

At least one-eighth of the land entering this program is mandated by law to be planted in trees. With a range of 40-45 million acres established for the Conservation Reserve Program, a minimum of 5 million acres will be planted in trees from 1986 to 1990, making the Conservation Reserve Program one of the most ambitious tree planting programs ever established. If 5 million additional acres of trees are indeed planted on diverted cropland, eventually an additional 31.5 billion cubic feet of wood will result over the life of the planting. That figure represents enough wood to supply the nation's total forest and wood product needs for two years. Whether the Conservation Reserve Program will result in a net increase in reforestation cannot yet be determined, but this program should certainly offset at least partially any negative impact of tax changes.

Forestry Outlook

The ultimate economic well-being of the forest industry hinges more on the uncertainties of supply than on demand, which is more predictable. Demand for paper, lumber, and myriad other wood products appears to be favorable over the long run. The degree to which the industry can meet market demand is limited by the availability of the basic resource, timber. If reforestation occurs at the rate needed and modern timber management practices are adopted, the future timber supply can be increased significantly.

Recent trends in planting and harvesting of trees provide little good news, though. For example, in 1986, 61 Georgia counties were harvesting more pine timber than they were growing. Despite setting records for tree planting in the mid-1980s, Georgia continues to experience a net loss of timberland. In this decade, an average 100,000 acres of pine forests have been lost each year.

On privately owned land, less than 35 percent of the timberland is replanted after harvest. Considering that 64 percent of Georgia's commercial forests are privately owned, these figures do not have good future implications. Changes in tax laws may have little negative impact on tree planting, but they also provide little assistance from a fiscal perspective in alleviating the potential timber shortage. Such a shortage seems likely, given the predominance of private forest land tenure arrangements in the Southeast and the low ratio of reforestation on such property.

The 1986 tax legislation's importance rests not on what the act did as much as what it did not do. The Tax Reform Act of 1986 may prove to be a modest damper on forestry investment that

provides no additional encouragement to replant forests and make other needed investments. The overall effect of the law may not significantly lessen timber supply in the future, especially with the Conservation Reserve Program in existence, but the Tax Reform Act of 1986 certainly will not assist in saving the timber supply from what appears to be a growing shortage.

Notes

[1]Anderson (1988): 922.
[2]Levine (1988): 125.
[3]Trenchi and Flick (1982): 22.
[4]Seskin and Sullivan (1987): 16.
[5]Because Georgia is such a major part of the forest industry, the remainder of this article uses the Georgia forest industry as an example on the assumption that developments in this state are broadly representative of the industry nationally. Forestry in Georgia—as measured by sales—comprises an $8 billion-plus industry that employs approximately 80,000 people. The annual timber harvest is valued at roughly $400 million. For every dollar of these timber sales, the state's manufacturers produce final products worth more than ten dollars. For each dollar of income received from timber sales, other Georgians earn an additional six dollars transporting, processing, or marketing timber or timber products (Montgomery and Chaffin, 1982, 7). On its own, Georgia would rank in the top ten of the world's leading producers of pulp, paper, and paperboard.

References

American Paper Institute. *Statistics of Paper, Paperboard, and Wood Pulp.* New York: American Paper Institute, 1985.

American Pulpwood Association, Inc. *Pulpwood Statistics.* Washington, D.C.: American Pulpwood Association, Inc., June 1986.

Anderson, Richard. "Paper and Forest Products Industry." *Valueline,* January 29, 1988, 922-23.

Birdsey, Richard A., and William H. McWilliams. *Midsouth Forest Area Trends.* Resource Bulletin SO-107. New Orleans, La.: Southern Forest Experiment Station, Forest Service, U.S. Department of Agriculture, 1986.

Duerr, William A., ed. *Timber! Problems, Prospects, Policies.* Ames, Iowa: Iowa State University Press, 1973.

Gunter, John, and Douglas C. Bachtal. *Forest Resources: Problems and Potentials for Georgia,* vol. 2, no. 1. Athens, Ga.: University of Georgia, College of Agriculture, Cooperative Extension Service, November 1984.

Gunter, John, and Harry L. Haney, Jr. *Essentials of Forestry Investment Analysis.* Corvallis, Oregon: OSU Bookstores Inc., 1984.

Gunter, John, Kim D. Coder, and Walker Rivers. *Tree Planting in Georgia under the Conservation Reserve Program,* MP-225. Georgia Forestry Commission and the Georgia Cooperative Extension Service, February 1986.

Levine, Jonathan B. "So You Don't Believe Money Grows On Trees?" *Business Week,* January 11, 1988, 125.

Maki, Wilbur R., Con H. Schallau, Bennet B. Foster, and Clair H. Redmond. "Alabama's Forest Products Industry: Performance and Contribution to the State's Economy, 1970 to 1980." Research Paper PNW-361. Pacific Northwest Research Station, Forest Service, U.S. Department of Agriculture, May 1986.

Milliken, Russell B., and William H. Bradley. "How Will Tax Reform Affect Timberland Investment?" *Southern Pulp and Paper,* December 1986, 14-17.

Milliken, Russell B., and Frederick W. Cubbage. "Trends in Southern Pine Timber Price Appreciation and Timberland Investment Returns, 1955 to 1983." Research Report No. 475. Athens, Ga.: University of Georgia, June 1985.

Montgomery, Albert A. "The Pulp and Paper Industry and Georgia's Forest Resources: An Economic Outlook." Georgia Forest Research Paper 26. Georgia Forestry Commission, February 1982.

_____, and Robert L. Chaffin. "The Economic Importance of Georgia's Forest Industry." Georgia Forest Research Paper 27. Research Division, Georgia Forestry Commission, April 1982.

Rudis, Victor A., and Richard A. Birdsey. *Forest Resource Trends and Current Conditions in the Lower Mississippi Valley.* Resource Bulletin SO-116. New Orleans, La.: Forest Service, Southern Forest Experiment Station, U.S. Department of Agriculture, December 1986.

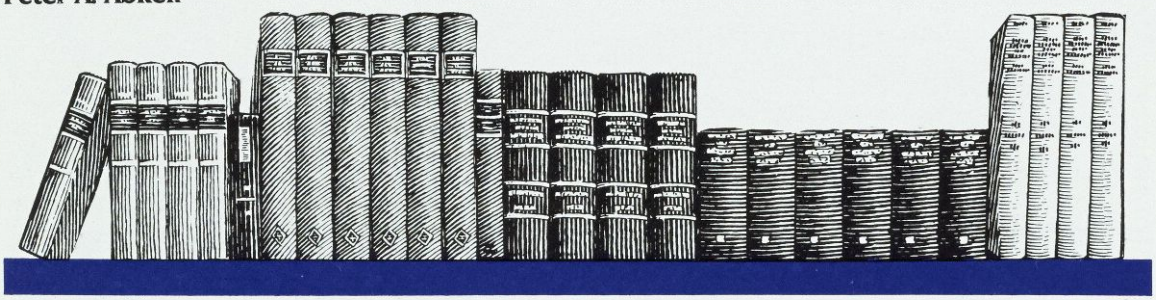
Seskin, Eugene P., and David F. Sullivan. "Plant and Equipment Expenditures." *Survey of Current Business,* vol. 67, no. 12. U.S. Department of Commerce, Bureau of Economic Analysis, December 1987, 16-19.

Trenchi, Peter, III, and Warren A. Flick. *Input-Output Model of Alabama's Economy: Understanding Forestry's Role.* Bulletin 534. Auburn, Ala.: Alabama Agricultural Experiment Station, 1982.

Book Review

Stock Market Activity in October 1987: The Brady, CFTC, and SEC Reports

Peter A. Abken



To what extent did the October 19, 1987, stock market crash result from a malfunctioning of market mechanisms? Analysts have grappled with this question since last fall; the answer is crucial to the development of future regulatory policies for financial markets.

Three particularly influential reports focus on the functioning of market mechanisms during October 1987 and propose ways to avoid a recurrence of such financial turmoil. These reports are the *Reports of the Presidential Task Force on Market Mechanisms* (the "Brady report"), the *Final Report on Stock Index Futures and Cash Market Activity during October 1987 to the U.S. Commodity Futures Trading Commission* (the "CFTC report"), and *The October 1987 Market Break* (the Securities and Exchange Commission [SEC] report). The following review concentrates on two major questions addressed in each of these studies: (1) what role did program trading play in the market decline, and (2) what, if anything, should be done about program trading?

This review focuses on the trading activity on two of the most important financial exchanges: the New York Stock Exchange (NYSE), where most of the stocks for major corporations are traded, and the Chicago Mercantile Exchange (CME), where the S&P 500 futures contract is traded. (More information on the S&P 500 futures can be found in this issue in the article by Kawaller, Koch, and Koch, "The Relationship between the S&P 500 Index and S&P 500 Index Futures Prices," p. 2.)

The NYSE and CME use two different market-making systems to facilitate transactions between buyer and seller. The NYSE is organized as a dealer market in which specialist firms are obligated to "make a market" in stocks that the exchange assigns to those companies. Their market-making responsibilities entail risk because the firms must take the opposite side of a transaction at a price close to the last transacted price if no one else will do so. The specialist is charged with maintaining an orderly market, which requires holding an inventory of stock, thus exposing the firm to price risk. Unlike the NYSE, the floor traders on the CME are not obligated to take positions in futures contracts; these traders act as brokers, matching buyer and seller. However, they also take positions in futures contracts, albeit briefly, to profit from price fluctuations caused by imbalances in buy and sell orders. In this respect, CME floor traders provide liquidity to the futures markets.

For markets in which price expectations are not changing sharply, the provision of liquidity enables stocks or futures contracts to be bought or sold with low transactions costs and fast

---

The reviewer, a specialist in futures and options markets, is an economist in the financial section of the Atlanta Fed's Research Department.

execution at prices near the last transacted prices. What happens in these markets when broad-based uncertainty about price expectations is present, as in mid-October? Much of the controversy surrounding program trading—the institutional trading of all stocks in a program or index on which options or futures are traded—centers on the adequacy of market liquidity to accommodate trading when prices are changing rapidly.[1] Two relatively new program trading strategies at the heart of the debate over market function or dysfunction are stock-index arbitrage and portfolio insurance. Considered both singly and jointly, they are widely alleged to have exacerbated, and perhaps precipitated, the stock market collapse on Monday, October 19.

Despite background research and exhaustive reconstructions of events, the Brady Commission, the SEC, and the CFTC arrive at conflicting conclusions regarding the culpability of program trading. The Brady and SEC reports find program trading, and particularly portfolio insurance, significantly involved in both elevating market uncertainty as well as directly and indirectly driving stock prices lower than they would have fallen otherwise. The CFTC report, on the other hand, concludes that the crash resulted entirely from a massive change in investor price expectations, and the claim that program trading contributed significantly to the market break is unsubstantiated. Each of the reports details the mechanics of program trading. A brief overview here will lay the groundwork for a later discussion of the sources of disagreement among the market reports. Also, the November/December 1987 *Economic Review* included "An Introduction to Portfolio Insurance," which gives a thorough discussion of that topic, as well as references on stock-index arbitrage.

A Review of Program Trading Strategies

Stock-index arbitrage is the simpler of the two basic varieties of program trading. Stock-index arbitrageurs attempt to make riskless profits by exploiting price discrepancies between the S&P 500 index and S&P 500 futures prices. The flow of transactions on the CME and NYSE will generally be different, often driving index and futures prices away from their appropriate price relationship, known as the *basis*. For example, a negative basis, in which the futures price is below the index, indicates a price misalignment, provided all component stocks are being actively traded.

The activity of arbitrageurs tends to align stock and index prices. Arbitrageurs buy futures when futures prices are relatively low and simultaneously sell the stocks underlying the index when stock prices are relatively high, and vice versa. The arbitrageurs are said to be perfectly hedged because their return depends only on the relative movement of the futures vis-a-vis the index prices, not on the absolute change in their price levels. Their buy or sell orders for the component stocks are sent to the specialists via the NYSE's DOT (Designated Order Turnaround) system. Separate buy or sell orders for hundreds of S&P component stocks (not necessarily all stocks in the index) are routed to the specialists on the NYSE floor and are usually executed within minutes. Rapid execution is critical, for otherwise the arbitrageur is exposed to changes in the absolute price level of the index, not just the relative difference between the index and the index futures price. During volatile markets, the flow of arbitrage orders channeled almost instantly to specialists through the DOT system can be extremely heavy, leading to order imbalances that the specialists must try to absorb.

Portfolio insurance strategies involve systematic adjustments to a portfolio, typically an index portfolio, to limit its exposure to stock market fluctuations. The object of the strategy is to guarantee a prespecified rate of return on a portfolio over some predetermined time period. The strategy places part of a portfolio in "cash," that is, Treasury bills, and the remainder in equity. As the market rises, the equity component is increased by selling Treasury bills. When the market falls, portfolio managers increase the cash component. The same division of a portfolio into equity and cash components can be achieved using an equity portfolio and index futures contracts. By selling (going short) an appropriate number of index futures and holding the underlying stocks, any fraction of the equity portfolio can be converted into a hedged position that is equivalent to cash. In recent

years, most portfolio insurance has been implemented this way because the transactions costs of using futures are generally lower. It is important to bear in mind that portfolio insurance is a reactive, not speculative, trading technique: as the market declines, futures are sold; as it rises, futures are bought.

The Reports' Findings

Before the mid-October decline, many analysts were concerned about the potentially destabilizing interaction between index arbitrage and portfolio insurance trading. The SEC and CFTC reports discuss concerns about a so-called cascade scenario that was originally described in an SEC report following a sharp market decline in September 1986. The scenario begins with a decline in futures prices, for fundamental or other reasons, that triggers stock-index arbitrage. Arbitrage selling, in turn, depresses stock prices and affects the futures market via portfolio insurance futures selling in response to the stock market decline. Further arbitrage is induced, which in addition to setting off more portfolio insurance futures selling might also lead to stop-loss selling of individual stocks, liquidations due to margin calls, and so forth. The cycle intensifies and culminates with a market collapse.

After October 19, the cascade scenario, in one form or another, showed up in media accounts of the crash.[2] Each of the reports considers the interaction of portfolio insurance, and stock index futures trading generally, with stock index arbitrage. Much of the analysis in the CFTC report is devoted to disproving the cascade hypothesis.

The main differences between the Brady and SEC reports compared to the CFTC report regarding the role of program trading in the crash stem from the emphasis they place on psychological factors. Two important examples will be considered below. The different conclusions are especially striking in comparing the SEC and CFTC reports because the analyses in both reports were based on two shared data bases: (1) the special CFTC/SEC survey of the trading activity, particularly involving index arbitrage and portfolio insurance, of 16 firms that were major participants in both the stock and index futures markets in mid-October and (2) the CFTC's daily large-trader position reports on futures activity, which do not explicitly identify program trading. Staff interviews with key market participants during the mid-October period also supplemented the survey information.

Whether explicit or implicit, assumptions regarding the impact of extreme price volatility also contributed greatly to shaping each report's eventual conclusions and recommendations. The SEC report states that "[i]n conducting our analysis, we have adopted the fundamental assumption that extreme price volatility, such as occurred during the market break, is undesirable" (p. xi). They justify their viewpoint by pointing out that volatility reduces market liquidity, makes the provision of market-making services more costly and less efficient, and weakens investor confidence in equity investments. All of these adverse effects may ultimately reduce the rate of capital formation in the long run. Although not directly stated, the Brady report basically takes the same view of volatility. Their focus on market mechanisms is motivated by the "unusual frailty" that markets demonstrated in mid-October; individual markets suffered from an "illusion of liquidity." The CFTC report discusses episodes of short-term, technical pressures on stock or futures prices (that is, strained market liquidity), but, unlike the other reports, does not consider their potentially disruptive effects. To the CFTC, extreme volatility is a neutral consequence of extreme changes in market expectations.

"The main differences between the Brady and SEC reports compared to the CFTC report regarding the role of program trading in the crash stem from the emphasis they place on psychological factors."

The reports substantially agree on the fundamentals that appear to have set off the steep

decline in stock prices during the week before October 19. These factors were: (1) a merchandise trade deficit figure for August that showed less improvement than the market expected, (2) a continued depreciation of the dollar, (3) sharply higher short- and long-term interest rates, and (4) prospective tax legislation in Congress that would increase the costs of financing takeover activity. From Wednesday, October 14, to Friday, October 16, the Dow Jones Industrial Average (DJIA) closing changes from the previous day were -95, -58, and -108, respectively; the broader market indexes experienced similar large declines. Volume was extremely heavy and index arbitrage and portfolio insurance activity were likewise at a high level, although markets were not strained to the breaking point as they would be early in the following week.

"The reports substantially agree on the fundamentals that appear to have set off the steep decline in stock prices during the week before October 19."

Each report gives blow-by-blow details of intraday events in the various financial markets for these three days and those of the following week.

The October 14-16 period is of particular interest because the index arbitrage link between the CME and NYSE was functioning. Here the CFTC saw events differently from the Brady Commission and the SEC. Consider the then-record market decline on Friday, October 16. The CFTC report found that portfolio hedge activity, which includes portfolio insurance futures selling, was more or less evenly distributed throughout the day, with the greatest concentration of futures selling before 2:30 p.m. Index arbitrage sales were executed during the day in relatively concentrated intervals, especially toward the end of the day. At this time, though, part of the arbitrage was related to the expirations of some futures and options contracts (during the so-called "witching hour").

In analyzing the day's trading, the CFTC concluded that "neither the magnitudes nor the timing of this trading on October 16 is indicative of any significant interaction between portfolio hedging and index arbitrage sell programs" (p. 78). Neither the SEC report nor the Brady report focuses on portfolio insurance trading in terms of the cascade scenario. The SEC report states in a footnote that "this [cascade] scenario is far more simplistic than the multitude of factors influencing trading during the October market break. Nevertheless, the effects of futures selling on the stock market is relevant to what occurred" (p. 3-11). The Brady report also finds that during these days before October 19, "heavy arbitrage activity was most often coincident with substantial intraday stock market moves" (p. 29). This finding is not inconsistent with the CFTC report; the CFTC was not specifically concerned about index arbitrage-induced market volatility (see CFTC report, p. 79).

The Brady report goes further, asserting that "the market's decline [from Wednesday to Friday] created a huge overhang of selling pressure—enough to crush the equity markets in the following week" (p. 29). This overhang was concentrated within two groups of sellers: portfolio insurers and a few mutual fund groups needing to fulfill customer redemption orders. The Brady report maintains that on Friday, October 16, many market participants were on edge over the threat of continued selling pressure.

According to the Brady report, a number of aggressive "trading-oriented" institutions compounded the selling pressures by anticipating the reactive selling of the portfolio insurers and mutual funds and, concomitantly, selling ahead of them before further market declines. Of the $12 billion in stock that portfolio insurers needed to sell to meet the directives of their programs that week, only one-third had actually been sold, according to the Brady report. Both the CFTC report (p. 81) and SEC report (p. 3-12) mention the existence of an overhang of selling pressure, but neither give it the same emphasis as the Brady report.

Selling pressure during the NYSE opening on Monday, October 19, was in fact enormous.

Selling by institutional investors was the most significant factor, particularly at the opening. Index arbitrage selling was also prominent at the opening, although the CFTC states (pp. 91-92) that even during the morning, index arbitrage did not attain the concentrated levels of the previous week. Gross selling of S&P 500 futures for portfolio hedging purposes attained a record level of 20 percent of CME volume for the day; 80 percent of that hedge selling can be attributed specifically to portfolio insurance strategies (CFTC report, p. 93). Furthermore, one major pension fund, the largest portfolio insurance practitioner in the stock or futures markets, supplemented its futures sales with very large, periodic program sales of stock on the NYSE up until 2:00 p.m.

Each report documents how selling pressure was so powerful that the markets became congested. On the NYSE, in particular, the specialists were overwhelmed with sell orders. The imbalances led to late openings for many component stocks of the S&P 500 and to trading halts designed to give specialists time to work out these order imbalances. The reported futures basis was negative (that is, the futures price was below the index price) because the computation of the index value included many stock prices that were not current due to the disruptions in trading. The specialists' buying power was strained and liquidity dried up. The transactions costs of trading futures rose tremendously, making it difficult to match bids with offers. By early afternoon, the index arbitrage link between the exchanges was effectively severed because index arbitrage had become too risky, despite its apparent profitability. Trade execution times were highly uncertain. At this point in the early afternoon, as the Brady report puts it, both stock and futures markets went into freefall. The DJIA was down 508 points by the close; the broader indexes were likewise down by record amounts.

The Brady report comes close to describing the sequence of events on Monday in terms of the cascade scenario: "Portfolio insurers sold in the futures market, forcing prices down. The downward price pressure in the futures market was then transmitted to the stock market by index arbitrage and diverted portfolio insurance [stock] sales. While index arbitrageurs may not have accounted for a substantial part of total daily volume, they were particularly active during the day at times of substantial price movements. . . . [T]hey were the transmission mechanism for the pressures initiated by other institutions" (p. 42).

The SEC report emphasizes the timing of portfolio insurance and index arbitrage sales on Monday: "The periodic sell pressure from portfolio insurance related programs and more concentrated arbitrage sell programs sometimes hit the NYSE simultaneously" (p. A-29); "[t]he impact of the portfolio insurance stock selling combined with the impact of index arbitrage trading was the dominating force in the stock market during certain periods" (p. 3-12).

The CFTC report, in considering trading during the morning of October 19 before the arbitrage link broke down, found that "periods of high volume portfolio hedge sales in S&P 500 futures do not correspond with the periods of price weakness, nor do periods of low volume of such sales correspond with price recoveries" (p. 93). The report concludes that "the analysis of intraday trading does not support the contention that on October 19 the stock market fell as fast and as far as it did because of a continuously intensifying interaction between index arbitrage stock sales and portfolio insurance selling in the futures market" (p. 96).

"Each report documents how selling pressure was so powerful that the markets became congested. On the NYSE, in particular, the specialists were overwhelmed with sell orders."

The foregoing conclusions regarding the impact of program trading highlight the difference in interpretation of events on October 19. The intraday pattern of futures and stock price movements and their apparent correlation with intraday variations in trading of the various market participants does not in itself give convincing, clear-cut evidence about the

role of program trading. In each of the reports the method of analysis of the survey data basically amounted to an evaluation of the correlation of price movements with trading activity and evidently involved much subjective judgment.

Psychological Effects on the Market. In addition to studying the effects of program trading, the SEC and the Brady Commission go further to incorporate their evaluation of market psychology as a factor in explaining the market break. An important example involving psychological judgments concerns what the Brady report termed the "billboard" effect. As mentioned above, on the morning of October 19, the futures price was at a large discount to the index because many NYSE stocks were not trading. Was this a real or spurious discount? If real, the futures billboard would lead market participants to expect index arbitrage to drive stock prices lower. Buyers might be deterred from entering the stock market, and specialists might be hesitant to take the buy side just when the billboard is advertising a drop in the market.

"The Brady Commission makes the most sweeping, comprehensive recommendations for changing the way markets work and how they are regulated."

The CFTC report contains a section that corrects the value of the S&P 500 index for the so-called non-trading effect, something market participants had to do implicitly or explicitly. On Monday morning, the CFTC finds, the index arbitrage link was keeping futures and index prices aligned, and therefore the discount was spurious.[3] The CFTC believes it improbable that sophisticated broker/dealers "who conduct the majority of index arbitrage transactions [would respond] with massive futures/stock arbitrage programs to an illusory discount of the futures" (p. 19). In marked contrast, the Brady report gives the following account: "Ironically, the large discount on Monday morning was illusory. . . . Although the index arbitrageurs clearly knew that many stocks had not yet opened [on Monday morning], they nevertheless believed that a large discount existed. This belief led the index arbitrageurs to conclude that the market was headed much lower. . . ." (p. III-20). This excerpt illustrates the emphasis that the Brady report places on psychological assessments about what market participants thought was happening and what motivated them to act.

The Brady report's account of arbitrageur actions on Monday morning does not have a parallel account in the SEC report's detailed intraday market chronologies. Evidently, the Brady Commission based its evaluation of the billboard effect and other matters on interviews of market participants after the crash. The SEC also relied on interviews, although the SEC was more circumspect in their conclusions derived from such information. In contrast, the CFTC report downplays psychological factors influencing investor and market-maker behavior, concentrating instead on analyzing questions using the available data: intraday price movements, trading volume, trader positions, and so on. While the impact of investors' perceptions and fears on market activity is hard to determine, such evaluation appears to be an important and relevant part of the explanation for the mid-October decline. Though the Brady report emphasizes the importance of psychological factors—for example, the overhang and billboard effects—the report in some instances states judgments and conclusions with a certitude that seems inappropriate. The SEC report generally gives a more satisfactory account and analysis of market events because the report acknowledges the uncertainties that temper its conclusions.

The Reports' Recommendations

The recommendations of each of the reports are more difficult to compare than their analyses of the markets. The Brady Commission, the SEC, and the CFTC had different scopes and jurisdictions. The Brady Commission makes the most sweeping, comprehensive recommendations for changing the way markets work and how they are regulated. The CFTC, at the other

extreme, makes suggestions that involve the fewest changes, particularly to the regulatory structure.

The Brady Commission would like one agency to oversee intermarket issues. That responsibility, in their estimation, could perhaps best be carried out by the Federal Reserve. After the release of its report, the SEC expressed interest in taking over regulatory jurisdiction of stock-index futures trading, while, not surprisingly, the CFTC strongly argues against such a reallocation of responsibilities. In their respective reports, both the SEC and the CFTC suggest ways to improve interagency coordination, which, on the whole, they believed functioned well during the October crisis.

The Brady Commission recommends unifying clearing and credit mechanisms, which nearly disintegrated on October 20. Here, too, both the SEC and the CFTC call for more moderate refinements to the system. All reports agree that market surveillance and market information should be improved, especially in identifying customer trades and their timing.

The Brady Commission's proposal for "circuit-breaker" mechanisms such as price limits on futures and temporary trading halts on individual stocks are more or less consistent with positions taken by the CFTC and the SEC. To be effective, such circuit breakers need to be coordinated among markets. The Brady Commission and the SEC consider the "harmonizing" (the Brady Commission's term) of margin requirements across markets to be a useful step toward reducing price volatility. The CFTC emphatically rejects proposals to raise sharply the margins required on futures contracts. This divergence of views reflects, in part, differing assessments of what happened last October. The CFTC regards margin on futures as a performance bond to limit credit exposures, not as an extension of credit. They are not as concerned about intraday price volatility, nor do they believe that program trading is a significant source of that volatility. Although the Brady Commission and the SEC recognize the distinct functions of margin on stock and futures, both groups also are concerned about the concentration, size, and frequency of program-related trades and their impact on market liquidity.

To alleviate some of the liquidity strains that program trading may cause, the SEC recommends that the NYSE allow one or more well-capitalized specialists to trade market baskets of stocks. In their opinion, this market basket trading would add an additional layer of liquidity that would be more effective in dampening the price impacts of program trades than simply increasing the capital of specialists in individual stocks. This proposal, which had been discussed by academics and others before the crash, is a good example of a relatively small refinement of market mechanisms that has the promise of doing much for market liquidity and stability.

The appropriate course of action in the wake of the October 1987 market break still remains to be decided, and the various recommendations continue to stir controversy. In light of the uncertainties, incremental reforms appear to be prudent. Legislators and regulators should not rush to restructure either the market mechanisms or the regulatory system without much more compelling evidence that such changes would help markets and society at large.

Notes

[1] John Downes and Jordan Elliot Goodman, *Dictionary of Finance and Investment Terms*, 2nd. ed. New York: Barrons, 1987, 311.

[2] Two examples are Anise C. Wallace, "A Suspect in Market's Plunge," *New York Times*, November 30, 1987; and George Melloan, "The Market Meltdown Made Phelan a Prophet," *Wall Street Journal*, October 26, 1987.

[3] The SEC did a similar analysis that is consistent with the CFTC's conclusion. See SEC, p. 2-13, footnote 49.

A Review of the Reports' Basic Findings

	Diagnoses	Recommendations		Other Comments
	Role of Program Trading in Crash	For Limits on Market Activity	For Regulation	
SEC	Significantly involved in elevating market uncertainty and driving stock prices lower than they would have fallen otherwise.	Price limits on futures. Temporary trading halts for individual stocks. Make margin requirements more uniform.	Improve interagency coordination.	Sees cascade scenario as oversimplified, but concludes futures trading did contribute to the crash. Moderate refinement of clearing and credit mechanisms recommended. Improve market surveillance and information. Allow a well-capitalized specialist to trade market baskets of stocks.
CFTC	Not a significant factor in the crash.	Price limits on futures. Do *not* sharply raise margins required on futures contracts.	Improve interagency coordination.	Disputes cascade scenario. Moderate refinement of clearing and credit mechanisms recommended. Improve market surveillance and information. Use intraday margin settlements.
Brady	Significantly involved in elevating market uncertainty and driving stock prices lower than they would have fallen otherwise.	Price limits on futures. Temporary trading halts for individual stocks. Make margin requirements more uniform. Emphasize restraints on trading coordinated across markets.	One agency, perhaps the Fed, to oversee intermarket issues.	Emphasizes overhang of selling pressure from October 14-16 and other psychological factors. Unification of clearing and credit mechanisms recommended. Improve market surveillance and information.

FINANCE

$ millions	MAR 1988	FEB 1988	JAN(r) 1988	MAR 1987	FEB 1987	JAN 1987	ANN. % CHG.(*)
UNITED STATES							
Commercial Bank Deposits	1,771,229	1,752,092	1,786,634	1,640,782	1,643,266	1,709,673	+ 8
Demand	349,724	351,392	391,055	351,074	358,444	428,644	- 0
NOW	167,835	162,565	166,539	147,991	145,795	152,808	+13
Savings	515,006	509,358	509,270	506,150	504,327	507,689	+ 2
Time	777,296	765,316	761,466	675,347	673,971	675,081	+15
SOUTHEAST							
Commercial Bank Deposits	215,075	211,874	213,743	196,591	195,147	199,149	+ 9
Demand	41,031	39,901	43,312	39,661	39,308	45,531	+ 3
NOW	23,970	23,086	23,335	21,061	20,640	21,317	+14
Savings	57,767	57,196	57,245	57,647	56,976	56,686	+ 0
Time	96,853	95,615	94,708	82,571	82,237	81,772	+17
ALABAMA							
Commercial Bank Deposits	21,926	21,457	21,476	19,840	19,563	20,034	+11
Demand	4,123	4,012	4,265	3,965	3,966	4,554	+ 4
NOW	2,453	2,344	2,374	2,055	2,009	2,103	+19
Savings	4,816	4,720	4,708	4,567	4,335	4,266	+ 5
Time	11,071	10,790	10,621	9,744	9,663	9,706	+14
FLORIDA							
Commercial Bank Deposits	85,181	83,696	84,396	76,876	76,139	77,603	+11
Demand	16,065	15,480	16,647	15,497	15,194	17,663	+ 4
NOW	10,831	10,362	10,511	9,449	9,254	9,539	+15
Savings	27,236	26,940	27,017	26,928	26,627	26,549	+ 1
Time	32,787	32,454	32,139	26,771	26,866	26,607	+22
GEORGIA							
Commercial Bank Deposits	34,453	34,101	34,744	30,997	30,788	31,967	+11
Demand	8,537	8,398	9,234	8,217	8,164	9,516	+ 4
NOW	3,343	3,275	3,316	2,979	2,957	3,072	+12
Savings	9,015	8,972	8,939	9,119	9,080	9,130	- 1
Time	15,087	14,986	14,911	12,141	11,881	11,992	+24
LOUISIANA							
Commercial Bank Deposits	28,259	28,128	28,271	27,386	27,556	27,663	+ 3
Demand	5,041	4,908	5,271	4,923	4,949	5,553	+ 2
NOW	2,426	2,497	2,510	2,172	2,210	2,226	+12
Savings	8,024	7,979	7,956	7,948	7,927	7,729	+ 1
Time	13,224	13,091	13,058	12,779	12,863	12,756	+ 3
MISSISSIPPI							
Commercial Bank Deposits	14,928	14,614	14,560	13,812	13,659	13,645	+ 8
Demand	2,310	2,266	2,454	2,307	2,327	2,609	+ 0
NOW	1,580	1,473	1,434	1,411	1,320	1,327	+12
Savings	2,922	2,878	2,867	3,093	3,068	3,013	- 6
Time	8,442	8,247	8,081	7,295	7,241	7,058	+16
TENNESSEE							
Commercial Bank Deposit	30,328	29,878	30,296	27,680	27,442	28,237	+10
Demand	4,955	4,837	5,441	4,752	4,708	5,636	+ 4
NOW	3,337	3,135	3,190	2,995	2,890	3,050	+11
Savings	5,754	5,707	5,758	5,992	5,939	5,999	- 4
Time	16,242	16,047	15,898	13,841	13,723	13,653	+17

NOTES:

All deposit data are extracted from the Federal Reserve Report of Transaction Accounts, other Deposits and Vault Cash (FR2900), and are reported for the average of the week ending the 1st Monday of the month. Most recent data, reported institutions with over $30 million in deposits and $3.2 million of reserve requirements as of December 1987, represents 95% of deposits in the six state area. The major differences between this report and the "call report" are size, the treatment of interbank deposits, and the treatment of float. The total deposit data generated from the Report of Transaction Accounts eliminates interbank deposits by reporting the net of deposits "due to" and "due from" other depository institutions. The Report of Transaction Accounts subtracts cash in process of collection from demand deposits, while the call report does not. The Southeast data represent the total of the six states. Subcategories were chosen on a selective basis and do not add to total.

r - revised

* - Most recent month vs. year-ago month.

FINANCE

$ millions	MAY(p) 1988	APR 1988	MAR 1988	MAY 1987	APR 1987	MAR 1987	ANN. % CHG.(*)
UNITED STATES							
Commercial Bank Deposits	1,779,310	1,792,663	1,771,229	1,660,331	1,677,942	1,640,782	+ 7
Demand	358,866	357,752	349,724	351,237	358,994	351,074	+ 2
NOW	170,376	170,782	167,835	152,850	159,216	147,991	+11
Savings	513,400	520,361	515,006	509,119	517,511	506,150	+ 1
Time	780,435	779,940	777,296	678,900	676,670	675,347	+15
SOUTHEAST							
Commercial Bank Deposits	215,983	217,791	215,075	199,060	201,584	196,591	+ 9
Demand	41,045	41,866	41,031	40,350	41,491	39,661	+ 2
NOW	23,721	24,197	23,970	21,759	22,633	21,061	+ 9
Savings	57,959	58,891	57,767	57,643	58,813	57,647	+ 1
Time	97,538	97,066	96,853	83,016	82,588	82,571	+17
ALABAMA							
Commercial Bank Deposits	21,914	22,255	21,926	19,954	20,265	19,840	+10
Demand	3,999	4,193	4,123	4,025	4,092	3,965	- 1
NOW	2,523	2,499	2,453	2,102	2,158	2,055	+20
Savings	4,813	4,906	4,816	4,579	4,658	4,567	+ 5
Time	11,057	11,154	11,071	9,700	9,738	9,744	+14
FLORIDA							
Commercial Bank Deposits	85,292	86,201	85,181	77,652	79,043	76,876	+10
Demand	16,081	16,366	16,065	15,825	16,420	15,497	+ 2
NOW	10,728	10,974	10,831	9,917	10,364	9,449	+ 8
Savings	27,137	27,612	27,236	26,980	27,476	26,928	+ 1
Time	33,049	32,867	32,787	26,523	26,552	26,771	+25
GEORGIA							
Commercial Bank Deposits	35,267	35,191	34,453	31,827	31,842	30,997	+11
Demand	8,668	8,865	8,537	8,303	8,460	8,217	+ 4
NOW	3,310	3,377	3,343	3,077	3,182	2,979	+ 8
Savings	9,189	9,341	9,015	8,963	9,225	9,119	+ 3
Time	15,584	15,165	15,087	12,730	12,321	12,141	+22
LOUISIANA							
Commercial Bank Deposits	28,089	28,366	28,259	27,404	27,758	27,386	+ 2
Demand	5,002	4,987	5,041	4,931	5,035	4,923	+ 1
NOW	2,392	2,434	2,426	2,221	2,299	2,172	+ 8
Savings	8,032	8,146	8,024	7,980	8,116	7,948	+ 1
Time	13,069	13,144	13,224	12,626	12,663	12,779	+ 4
MISSISSIPPI							
Commercial Bank Deposits	15,054	15,124	14,928	14,034	14,188	13,812	+ 7
Demand	2,350	2,393	2,310	2,338	2,473	2,307	+ 1
NOW	1,536	1,585	1,580	1,400	1,466	1,411	+10
Savings	2,972	2,992	2,922	3,102	3,161	3,093	- 4
Time	8,472	8,454	8,442	7,416	7,350	7,295	+14
TENNESSEE							
Commercial Bank Deposit	30,367	30,654	30,328	28,189	28,488	27,680	+ 8
Demand	4,945	5,062	4,955	4,928	5,011	4,752	+ 0
NOW	3,232	3,328	3,337	3,042	3,164	2,995	+ 6
Savings	5,816	5,894	5,754	6,039	6,177	5,992	- 4
Time	16,307	16,282	16,242	14,021	13,964	13,841	+16

NOTES:

All deposit data are extracted from the Federal Reserve Report of Transaction Accounts, other Deposits and Vault Cash (FR2900), and are reported for the average of the week ending the 1st Monday of the month. Most recent data, reported institutions with over $30 million in deposits and $3.2 million of reserve requirements as of December 1987, represents 95% of deposits in the six state area. The major differences between this report and the "call report" are size, the treatment of interbank deposits, and the treatment of float. The total deposit data generated from the Report of Transaction Accounts eliminates interbank deposits by reporting the net of deposits "due to" and "due from" other depository institutions. The Report of Transaction Accounts subtracts cash in process of collection from demand deposits, while the call report does not. The Southeast data represent the total of the six states. Subcategories were chosen on a selective basis and do not add to total.

p - preliminary

* - Most recent month vs. year-ago month.

EMPLOYMENT

	MAR 1988	FEB 1988	MAR 1987	ANN. % CHG		MAR 1988	FEB 1988	MAR 1987	ANN. % CHG
UNITED STATES									
Civilian Labor Force - thous.	119,957	119,942	118,353	+ 1	Nonfarm Employment - thous.	84,379	83,664	81,565	+ 3
Total Employed - thous.	112,867	112,460	110,229	+ 2	Manufacturing	19,319	19,287	18,897	+ 2
Total Unemployed - thous.	7,090	7,482	8,124	-13	Construction	4,802	4,632	4,599	+ 4
					Trade	24,190	23,653	23,461	+ 3
Unemployment Rate - % SA	5.6	5.7	6.5		Government	17,689	17,575	17,310	+ 2
					Services	24,842	24,585	23,723	+ 5
Mfg. Avg. Wkly. Hours	40.9	40.7	40.9	0	Fin., Ins. & Real Est.	6,664	6,623	6,478	+ 3
Mfg. Avg. Wkly. Earn. - $	412	404	403	+ 2	Trans., Com. & Pub. Util.	5,462	5,438	5,275	+ 4
SOUTHEAST									
Civilian Labor Force - thous.	16,397	16,349	15,134	+ 8	Nonfarm Employment - thous.	13,815	13,747	13,320	+ 4
Total Employed - thous.	15,360	15,219	14,872	+ 3	Manufacturing	2,364	2,359	2,322	+ 2
Total Unemployed - thous.	1,065	1,131	1,250	-15	Construction	776	768	755	+ 3
					Trade	3,383	3,363	3,313	+ 2
Unemployment Rate - % SA	6.3	6.5	7.5		Government	2,427	2,416	2,353	+ 3
					Services	3,110	3,084	2,947	+ 6
Mfg. Avg. Wkly. Hours	41.8	41.8	41.7	+ 0	Fin., Ins. & Real Est.	820	818	791	+ 4
Mfg. Avg. Wkly. Earn. - $	375	373	370	+ 1	Trans., Com. & Pub. Util.	758	757	738	+ 3
ALABAMA									
Civilian Labor Force - thous.	1,851	1,873	1,865	- 1	Nonfarm Employment - thous.	1,515	1,511	1,473	+ 3
Total Employed - thous.	1,741	1,729	1,698	+ 3	Manufacturing	372	371	356	+ 4
Total Unemployed - thous.	137	144	168	-28	Construction	73	72	71	+ 3
					Trade	332	332	322	+ 3
Unemployment Rate - % SA	6.8	6.0	8.4		Government	305	305	301	+ 1
					Services	281	278	270	- 7
Mfg. Avg. Wkly. Hours	41.0	40.8	40.9	+ 0	Fin., Ins. & Real Est.	70	70	70	0
Mfg. Avg. Wkly. Earn. - $	368	366	356	+ 3	Trans., Com. & Pub. Util.	72	72	72	0
FLORIDA									
Civilian Labor Force - thous.	6,045	5,959	4,823	+25	Nonfarm Employment - thous.	5,100	5,062	4,823	+ 6
Total Employed - thous.	5,758	5,661	5,498	+ 5	Manufacturing	542	543	528	+ 3
Total Unemployed - thous.	287	298	312	- 8	Construction	346	346	337	+ 3
					Trade	1,397	1,383	1,313	+ 6
Unemployment Rate - % SA	4.9	5.3	5.6		Government	780	774	737	+ 6
					Services	1,396	1,380	1,296	- 8
Mfg. Avg. Wkly. Hours	44.4	46.0	45.6	- 3	Fin., Ins. & Real Est.	370	368	354	+ 5
Mfg. Avg. Wkly. Earn. - $	392	398	402	- 2	Trans., Com. & Pub. Util.	260	259	253	+ 3
GEORGIA									
Civilian Labor Force - thous.	3,067	3,057	3,012	+ 2	Nonfarm Employment - thous.	2,784	2,777	2,726	+ 2
Total Employed - thous.	2,888	2,874	2,833	+ 2	Manufacturing	573	573	564	+ 2
Total Unemployed - thous.	179	184	179	0	Construction	148	146	147	+ 1
					Trade	689	688	681	+ 1
Unemployment Rate - % SA	5.8	5.7	5.9		Government	490	487	476	+ 3
					Services	546	546	526	+ 4
Mfg. Avg. Wkly. Hours	41.4	41.6	41.0	+ 1	Fin., Ins. & Real Est.	156	155	152	+ 3
Mfg. Avg. Wkly. Earn. - $	356	356	345	+ 3	Trans., Com. & Pub. Util.	175	174	171	+ 2
LOUISIANA									
Civilian Labor Force - thous.	1,900	1,910	1,966	- 3	Nonfarm Employment - thous.	1,495	1,490	1,465	+ 2
Total Employed - thous.	1,678	1,676	1,690	- 1	Manufacturing	167	166	159	+ 1
Total Unemployed - thous.	223	238	276	-19	Construction	79	77	79	0
					Trade	362	363	356	+ 2
Unemployment Rate - % SA	11.3	11.7	13.6		Government	315	314	315	0
					Services	328	327	314	+ 4
Mfg. Avg. Wkly. Hours	42.3	41.9	41.8	+ 1	Fin., Ins. & Real Est.	85	85	84	+ 1
Mfg. Avg. Wkly. Earn. - $	456	454	458	- 0	Trans., Com. & Pub. Util.	104	104	103	+ 1
MISSISSIPPI									
Civilian Labor Force - thous.	1,159	1,169	1,153	+ 1	Nonfarm Employment - thous.	880	877	850	+ 4
Total Employed - thous.	1,059	1,055	1,015	+ 4	Manufacturing	233	233	214	+ 4
Total Unemployed - thous.	100	114	138	-28	Construction	33	33	31	+ 6
					Trade	186	185	180	+ 3
Unemployment Rate - % SA	8.2	8.9	11.3		Government	199	199	193	+ 3
					Services	141	140	137	+ 3
Mfg. Avg. Wkly. Hours	40.0	39.5	39.9	+ 2	Fin., Ins. & Real Est.	39	39	38	+ 3
Mfg. Avg. Wkly. Earn. - $	310	307	303	+ 2	Trans., Com. & Pub. Util.	43	42	41	+ 5
TENNESSEE									
Civilian Labor Force - thous.	2,375	2,381	2,315	+ 3	Nonfarm Employment - thous.	2,041	2,029	1,978	+ 3
Total Employed - thous.	2,236	2,224	2,138	+ 5	Manufacturing	498	499	494	+ 1
Total Unemployed - thous.	139	157	177	-21	Construction	105	105	93	+13
					Trade	473	477	461	+ 3
Unemployment Rate - % SA	5.6	5.7	6.5		Government	337	339	330	+ 2
					Services	413	417	402	+ 3
Mfg. Avg. Wkly. Hours	42.1	41.0	41.1	+ 2	Fin., Ins. & Real Est.	101	101	94	+ 7
Mfg. Avg. Wkly. Earn. - $	373	362	361	+ 3	Trans., Com. & Pub. Util.	105	105	99	+ 6

NOTES: All labor force data are from Bureau of Labor Statistics reports supplied by state agencies.
Only the unemployment rate data are seasonally adjusted.
The Southeast data represent the total of the six states.

GENERAL

	LATEST DATA	CURR. PERIOD	PREV. PERIOD	YEAR AGO	ANN. % CHG.
UNITED STATES					
Personal Income ($ bil. - SAAR)	Q4	3,844.8	3,749.3	3,589.2	+ 7
Plane Pass. Arr. (thous.)		N.A.	N.A.	N.A.	
Petroleum Prod. (thous.)	MAR	8,187.0	8,240.0	8,433.0	- 3
Consumer Price Index 1967=100	MAR	349.0	347.4	335.9	+ 4
Kilowatt Hours - mils.	JAN	225.1	205.0	209.7	+ 7
SOUTHEAST					
Personal Income ($ bil. - SAAR)	Q4	468.1	465.7	439.0	+ 7
Plane Pass. Arr. (thous.)	MAR	N.A.	5,752.1	6,712.9	
Petroleum Prod. (thous.)	MAR	1,309.0	1,325.0	1,424.0	- 8
Consumer Price Index 1967=100		N.A.	N.A.	N.A.	
Kilowatt Hours - mils.	JAN	35.1	31.2	33.1	+ 6
ALABAMA					
Personal Income ($ bil. - SAAR)	Q4	49.2	48.6	46.4	+ 6
Plane Pass. Arr. (thous.)	MAR	181.3	144.4	185.2	- 3
Petroleum Prod. (thous.)	MAR	54.0	55.0	55.0	- 2
Consumer Price Index 1967=100		N.A.	N.A.	N.A.	
Kilowatt Hours - mils.	JAN	5.0	4.4	4.6	+ 9
FLORIDA					
Personal Income ($ bil. - SAAR)	Q4	189.7	185.1	174.3	+ 9
Plane Pass. Arr. (thous.)	MAR	N.A.	3,112.0	3,512.1	
Petroleum Prod. (thous.)	MAR	19.0	22.0	23.0	-13
Consumer Price Index		**MAR**	**JAN**	**MAR**	
1977=100 MIAMI		185.5	184.6	178.4	+ 4
Kilowatt Hours - mils.	JAN	10.0	9.2	9.4	+ 6
GEORGIA					
Personal Income ($ bil. - SAAR)	Q4	88.6	90.4	84.1	+ 5
Plane Pass. Arr. (thous.)	MAR	2,199.6	1,864.4	2,308.9	- 5
Petroleum Prod. (thous.)		N.A.	N.A.	N.A.	
Consumer Price Index 1967=100		N.A.	N.A.	N.A.	
Kilowatt Hours - mils.	JAN	6.0	5.4	5.6	+ 7
LOUISIANA					
Personal Income ($ bil. - SAAR)	Q4	51.4	50.7	49.8	+ 3
Plane Pass. Arr. (thous.)	MAR	329.4	307.5	382.4	-14
Petroleum Prod. (thous.)	MAR	1,163.0	1,174.0	1,266.0	- 8
Consumer Price Index 1967=100		N.A.	N.A.	N.A.	
Kilowatt Hours - mils.	JAN	4.9	4.3	4.8	+ 2
MISSISSIPPI					
Personal Income ($ bil. - SAAR)	Q4	26.9	27.2	25.5	+ 5
Plane Pass. Arr. (thous.)	MAR	45.3	35.1	38.5	+18
Petroleum Prod. (thous.)	MAR	73.0	74.0	80.0	- 9
Consumer Price Index 1967=100		N.A.	N.A.	N.A.	
Kilowatt Hours - mils.	JAN	2.4	2.1	2.3	- 4
TENNESSEE					
Personal Income ($ bil. - SAAR)	Q4	62.3	63.7	58.9	+ 6
Plane Pass. Arr. (thous.)	MAR	358.2	288.7	285.8	+25
Petroleum Prod. (thous.)		N.A.	N.A.	N.A.	
Consumer Price Index 1967=100		N.A.	N.A.	N.A.	
Kilowatt Hours - mils.	JAN	6.8	5.8	6.4	+ 6

	APR 1988	MAR(R) 1988	APR 1987	ANN. % CHG.
UNITED STATES				
Agriculture				
Prices Rec'd by Farmers Index (1977=100)	130	130	127	+ 2
Broiler Placements (thous.)	94,214	94,014	91,507	+ 3
Calf Prices ($ per cwt.)	95.20	92.30	75.10	+27
Broiler Prices (¢ per lb.)	28.00	27.50	29.60	- 5
Soybean Prices ($ per bu.)	6.36	5.93	4.90	+30
Broiler Feed Cost ($ per ton)	(Q2)181	(Q1)195	(Q2)189	- 4
SOUTHEAST				
Agriculture				
Prices Rec'd by Farmers Index (1977=100)	117	115	113	+ 4
Broiler Placements (thous.)	40,041	39,819	37,897	+ 6
Calf Prices ($ per cwt.)	96.34	91.07	72.73	+32
Broiler Prices (¢ per lb.)	26.27	25.77	27.67	- 5
Soybean Prices ($ per bu.)	6.51	6.16	5.04	+31
Broiler Feed Cost ($ per ton)	(Q2)163	(Q1)190	(Q2)173	- 6
ALABAMA				
Agriculture				
Farm Cash Receipts - $ mil. Dates: JAN., JAN	157		153	+ 3
Broiler Placements (thous.)	14,517	14,498	13,228	+10
Calf Prices ($ per cwt.)	100.00	91.80	71.80	+39
Broiler Prices (¢ per lb.)	26.00	25.50	27.00	- 4
Soybean Prices ($ per bu.)	6.51	6.13	5.03	+29
Broiler Feed Cost ($ per ton)	158	194	177	-11
FLORIDA				
Agriculture				
Farm Cash Receipts - $ mil. Dates: JAN., JAN.	622		584	+ 6
Broiler Placements (thous.)	2,405	2,558	2,402	+ 0
Calf Prices ($ per cwt.	105.00	100.00	76.30	+38
Broiler Prices (¢ per lb.)	26.60	26.10	28.00	- 5
Soybean Prices ($ per bu.)	6.51	6.13	5.03	+29
Broiler Feed Cost ($ per ton)	158	194	177	-11
GEORGIA				
Agriculture				
Farm Cash Receipts - $ mil. Dates: JAN., JAN.	210		201	+ 5
Broiler Placements (thous.	15,770	15,491	15,169	+ 4
Calf Prices ($ per cwt.)	93.00	86.10	70.20	+32
Broiler Prices (¢ per lb.)	25.50	25.00	27.00	- 6
Soybean Prices ($ per bu.)	6.61	6.03	5.04	+31
Broiler Feed Cost ($ per ton)	158	194	127	-11
LOUISIANA				
Agriculture				
Farm Cash Receipts - $ mil. Dates: JAN., JAN.	158		111	+42
Broiler Placements (thous.)	N.A.	N.A.	N.A.	
Calf Prices ($ per cwt.)	93.00	92.00	72.50	+28
Broiler Prices (¢ per lb.)	N.A.	N.A.	N.A.	
Soybean Prices ($ per bu.)	6.65	6.30	5.06	+31
Broiler Feed Cost ($ per ton)	185	N.A.	159	+16
MISSISSIPPI				
Agriculture				
Farm Cash Receipts - $ mil. Dates: JAN., JAN.	208		149	+40
Broiler Placements (thous.)	7,350	7,259	7,047	+ 4
Calf Prices ($ per cwt.)	93.70	92.30	74.20	+26
Broiler Prices (¢ per lb.)	28.20	27.70	30.10	- 6
Soybean Prices ($ per bu.)	6.63	6.10	5.05	+31
Broiler Feed Cost ($ per ton)	185	175	159	+16
TENNESSEE				
Agriculture				
Farm Cash Receipts - $ mil. Dates: JAN., JAN	177		151	+17
Broiler Placements (thous.)	N.A.	N.A.	N.A.	
Calf Prices ($ per cwt.)	90.70	83.10	70.50	+29
Broiler Prices (¢ per lb.)	N.A.	N.A.	N.A.	
Soybean Prices ($ per bu.)	6.18	6.60	5.01	+23
Broiler Feed Cost ($ per ton)	197	N.A.	205	- 4

NOTES: Personal Income data supplied by U. S. Department of Commerce. Taxable Sales are reported as a 12-month cumulative total. Plane Passenger Arrivals are collected from 26 airports. Petroleum Production data supplied by U. S. Bureau of Mines. Consumer Price Index data supplied by Bureau of Labor Statistics. Agriculture data supplied by U. S. Department of Agriculture. Farm Cash Receipts data are reported as cumulative for the calendar year through the month shown. Broiler placements are an average weekly rate. The Southeast data represent the total of the six states. N. A. = not available. The annual percent change calculation is based on most recent data over prior year. R = revised.

CONSTRUCTION

(12-month cumulative rate)

	MAR 1988	FEB 1988	MAR 1987	ANN. % CHG.		MAR 1988	FEB 1988	MAR 1987	ANN. % CHG.
UNITED STATES									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	50,596	50,447	47,020	+ 8	Value - $ Mil.	93,642	93,676	96,640	- 3
Industrial Bldgs.	7,275	7,264	8,424	+ 0	Residential Permits - Thous.				
Offices	13,357	13,297	13,599	- 2	Single-family units	1,007.0	1,010.7	1,088.8	- 8
Stores	13,169	13,076	12,014	+ 10	Multifamily units	467.9	476.4	626.8	-25
Hospitals	2,266	2,356	2,571	- 12	Total Building Permits				
Schools	1,131	1,089	1,154	- 2	Value - $ Mil.	140,944	140,829	143,672	- 2
SOUTHEAST									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	7,763	7,729	7,865	- 1	Value - $ Mil.	15,677	15,648	15,763	- 1
Industrial Bldgs.	867	849	1,120	- 23	Residential Permits - Thous.				
Offices	1,853	1,755	1,858	- 0	Single-family units	205.4	201.1	207.1	- 1
Stores	2,420	2,439	2,395	+ 1	Multifamily units	102.0	102.5	126.1	-20
Hospitals	483	523	472	+ 2	Total Building Permits				
Schools	274	274	151	+ 81	Value - $ Mil.	23,411	23,349	23,477	- 0
ALABAMA									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	511	507	588	- 13	Value - $ Mil.	619	627	671	- 8
Industrial Bldgs.	30	29	65	- 54	Residential Permits - Thous.				
Offices	158	160	176	- 10	Single-family units	10.0	10.2	11.5	+ 7
Stores	186	182	182	+ 2	Multifamily units	3.9	3.9	6.5	-40
Hospitals	16	16	19	- 16	Total Building Permits				
Schools	29	31	16	+ 81	Value - $ Mil.	1,131	1,134	1,259	-10
FLORIDA									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	3,722	3,776	3,854	- 3	Value - $ Mil.	9,029	9,038	8,630	+ 5
Industrial Bldgs.	387	358	417	- 7	Residential Permits - Thous.				
Offices	808	793	882	- 8	Single-family units	115.4	110.3	107.7	+ 7
Stores	1,098	1,122	1,155	- 5	Multifamily units	71.5	72.7	80.9	-12
Hospitals	173	219	312	- 45	Total Building Permits				
Schools	95	95	37	+154	Value - $ Mil.	12,751	12,814	12,484	+ 2
GEORGIA									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	1,820	1,813	1,761	+ 3	Value - $ Mil.	3,599	3,527	3,724	- 3
Industrial Bldgs.	264	266	350	- 25	Residential Permits - Thous.				
Offices	526	454	407	+ 29	Single-family units	46.8	47.0	51.2	- 9
Stores	565	565	541	+ 4	Multifamily units	17.6	16.2	21.7	-19
Hospitals	124	122	20	+520	Total Building Permits				
Schools	104	104	41	+154	Value - $ Mil.	5,491	5,340	5,485	+ 0
LOUISIANA									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	386	398	459	- 16	Value - $ Mil.	401	411	521	-23
Industrial Bldgs.	12	13	41	- 71	Residential Permits - Thous.				
Offices	63	65	102	- 38	Single-family units	6.4	6.6	7.8	-18
Stores	163	169	135	+ 21	Multifamily units	0.5	0.5	2.0	-75
Hospitals	106	104	39	+172	Total Building Permits				
Schools	14	14	41	- 66	Value - $ Mil.	787	809	941	-16
MISSISSIPPI									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	215	217	234	- 8	Value - $ Mil.	288	294	328	-12
Industrial Bldgs.	27	25	23	+ 17	Residential Permits - Thous.				
Offices	51	52	56	- 9	Single-family units	4.8	4.9	5.4	-11
Stores	62	62	78	- 21	Multifamily units	0.9	1.0	1.8	-50
Hospitals	16	18	23	- 30	Total Building Permits				
Schools	13	13	7	+ 86	Value - $ Mil.	503	510	561	-10
TENNESSEE									
Nonresidential Building Permits - $ Mil.					Residential Building Permits				
Total Nonresidential	1,038	1,018	970	+ 7	Value - $ Mil.	1,740	1,753	1,889	- 8
Industrial Bldgs.	147	158	224	- 34	Residential Permits - Thous.				
Offices	246	231	235	+ 5	Single-family units	22.0	22.1	23.5	- 6
Stores	347	339	304	+ 14	Multifamily units	7.7	8.2	13.2	-42
Hospitals	47	45	59	- 20	Total Building Permits				
Schools	18	17	9	+100	Value - $ Mil.	2,749	2,742	2,747	+ 0

NOTES: Data supplied by the U. S. Bureau of the Census, Housing Units Authorized By Building Permits and Public Contracts, C-40. Nonresidential data exclude the cost of construction for publicly owned buildings. The Southeast data represent the total of the six states.

Newsletters To Keep You Up-To-Date

The Federal Reserve Bank of Atlanta is pleased to announce a family of three newsletters designed to provide timely information on a variety of topics. *Economic Insight,* the bank's existing newsletter, has been renamed *Economics Update,* but will continue to feature economic trends and policy issues, as well as synopses of recent Atlanta Fed research on these topics. *Financial Update,* a new quarterly publication, will offer articles on developments in the payments system and issues pertaining to bank supervision and regulation. The new *Regional Update* newsletter, also issued quarterly, will cover economic conditions in the Sixth Federal Reserve District as a whole and monitor developments in the region's important industries.

If you would like to receive a free subscription to one, two, or all three of these newsletters, please fill out the coupon below and mail to:

Federal Reserve Bank of Atlanta
Public Information Department
104 Marietta Street, N.W.
Atlanta, Georgia 30303-2713

Note: If you are already a subscriber to Economic Insight, *your name will automatically be put on the mailing list for* Economics Update. *You do not need to resubscribe.*

Please add my name to the subscription list(s) of the newsletter(s) checked below.

☐ *Economics Update* ☐ *Financial Update* ☐ *Regional Update*

Name_____

Address_____

_____

City, State, Zip_____

Federal Reserve Bank of Atlanta
104 Marietta St., N.W.
Atlanta, Georgia 30303-2713

Address Correction Requested

Bulk Rate
U.S. Postage
PAID
Atlanta, Ga.
Permit 292