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COMPUTERS AND STOCKS

by James McDonald

UNDER THE BUTTONWOOD TREE

Here was the scene 176 years ago.

Twenty-four merchants and traders agreed to meet under the buttonwood tree on Wall Street in Manhattan to buy and sell securities. These hardy twenty-four traded in the $80 million bond issue that consolidated U.S. Revolutionary War debts. They also dealt in such speculative ventures as insurance company issues, Alexander Hamilton's First United States Bank, The Bank of North America and the Bank of New York.

Occasionally inclement weather—rather than any trading pressure—forced the respectable burghers inside. Thus, in 1793, the precursor of the New York Stock Exchange met regularly at the Tontine Coffee House.

Thereafter, for many years, changes were evolutionary and were assimilated without too much trouble. Gradually, however, volume increased, membership increased, share ownership broadened, communications improved, and the value of stocks soared.

Then came the post Korean War bull market. Believe it or not, average daily volume on the Big Board fifteen years ago was 1.4 million shares daily. By 1965 daily volume steadily moved along at an average of six million shares.

The new "900" ticker installed in 1964 by NYSE was capable of handling volume up to 12 million shares without falling behind. Brokers rejoiced in the commission income netted from the upsurge in volume and the market was hectic, but pretty orderly.

Cracks in the system appeared openly in 1966. Volume was considerably higher with the peak trading day seeing nearly 13.1 million shares changing hands before the closing bell.

By 1967 the resulting paper backlog and "fails" (a fail comes about when one broker does not deliver the securities he owes another within the five day settlement period) led the Board of Governors to take an unprecedented action. For nine business days in August, the most efficient securities organizations in the world closed their doors at 2:00 PM instead of the traditional 3:30 PM. The move was a clear indication that the back-office could not properly handle the volume anticipated in a normal day. Last year's average was over 10 million shares traded daily. Recently the NYSE has been handling around $130 billion worth of stocks and bonds annually.

Still the paperwork backed up, errors in posting transactions occurred more frequently, and the dollar amount of fails soared.

In late January, fails totaled $5.7 billion—more than $2 billion greater than the total only six months earlier. The Exchange went back to the 2:00 PM close this year and made it stick for six weeks.

Then came April, 1968. Sunday night, President Johnson indicated he would not seek renomination and that the U.S. would curtail bombing in North Vietnam. The first hour of trading was incredible. Before 11:00 AM, 6.06 million shares changed hands. Midweek the volume topped 51.5 million shares. Along the way the 1929 crash volume record of 16.4 million shares was shattered twice.

And a lot more was shattered—any delusion that the current state of Wall Street technology could begin to handle the load was buried in mountains of order slips, tickertape, bookkeeping entries, checks and ledgers.

THE PAPER TIGER

Probably more than any other institution, the securities markets have become the symbol of capitalism throughout the world. Public ownership of American business is at the very core of a free U.S. society, and Wall Street is the entire Western world's financial center.

Preservation of this free system depends on the abilities of financial specialists to solve the overwhelming problems. The attack on Wall Street's "Paper Tiger" was mapped out on several fronts—the exchanges, the unlisted securities markets, and the brokerage houses.

In all cases, one formidable weapon was enlisted for the front lines—electronic data processing technology. The computer had already proven its data processing capabilities in industry and government. The time was ripe for its move on Wall Street.

CENTRAL CERTIFICATE SERVICE (CCS)

One of the biggest obstacles to clearing the paperwork problem is the stock certificate—stocks must be delivered to brokers within five days of purchase. If certificates are not delivered, a "fail" occurs and a series of accounts payable and receivable result.

This summer, the New York Stock Exchange activated its computerized Central Certificate Service. Ideally, CCS works something like a regular bank checking system. Shares h in a broker's name are deposited centrally. A transfer o stock between brokers is made by computer, through a bookkeeping entry removing the shares from one account

and recording them in the account of the buying broker.

Each day the computer provides member firms with an activity statement, much like the monthly statement received by holders of checking accounts. The system also relieves brokers of the drudgery of inspecting, counting and storing stock certificates.

Limited activation of the system began alphabetically with about 320 stocks whose corporate names started with "A" through "C." These stocks accounted for about 30 per cent of the Exchange volume.

The Exchange plans to add stocks to the system steadily until about 1,200 Big Board issues are fully activated, hopefully by the end of this year. The computer project, which has been labeled "Top Priority" by Robert W. Haack, president of the Exchange, is expected to eliminate close to 75 per cent of the physical handling of stock certificates by brokers. R. John Cunningham, executive vice president of the Exchange, estimated that developmental cost for the system was close to $5 million.

Judging from a recent report other programs are also shaping up. On September 16, the NYSE reported that the "Fail Clearance" program, carried out for all NYSE listed stocks over a period of several weeks, produced a 20 per cent reduction in dollar value (about $290 million) in transactions overdue for settlement. A mandatory buy-in rule, which became operational August 2, for open contracts 50 days old or older in trades of stocks or bonds, resulted in settlement of 4,600 open transactions up to August 30.

The NYSE also announced the launching of a computerized program to facilitate member-firm processing of transactions in NYSE listed corporate bonds. The system will be used for over-the-counter trades in these bonds in addition to transactions on the floor of the Exchange. Scheduled to become fully operational by the end of the year, the system involves the computerized comparison of reports of buying and selling brokers to confirm specific details of their transactions. The bond comparisons began with trades of August 29, in bonds beginning with the letter "A," and will be expanded to include all corporate bond issues. The program will replace manual systems now in use at member firms.

AMEX — "FIRST WITH THE LADIES"

The American Exchange boasts a few firsts. It was the first to flash data electronically to the ticker tape, the first to formulate its own Market Index System and the first to elect women members. With that kind of record to uphold, the AMEX has been moving right along with its EDP plans.

AMEX had to face up to soaring volume in the past three years. A total of 1.15 billion shares was traded on the American last year—an average daily volume of 4.5 million shares. Compare that with 2.7 million a day in 1966—and an estimated 6 million a day this year.

AMEX is using a computerized procedure that eliminated 46 per cent of its members fails during April through June, 1968. The clearance program (the computer complex is in the Exchange Clearing Corporation) reduces the number of open items by a process called "netting." Here's how it works: If an AMEX member firm has failed to deliver 1,000 shares of a stock and has also failed to receive 900 shares of the same stock, the computer program compares the two items and reduces them to a "net"—a fail of 100 shares. Brokerage firms receiving statements of their net are therefore free to act much more quickly in making up their fails.

Recently, Ralph S. Saul, president of AMEX, announced it would purchase its third computer to boost clearing capacity from a sustained daily volume of 10 million shares to 14 million shares a day. He also announced that the Exchange has additional space options for an expanded computer center that could handle additional tasks, including automated processing of odd lots.

OVER THE COUNTER (OTC)

The OTC market, through which most companies sell their securities, faces different problems. As a free association of independent brokers—many of whom are members of Exchange firms—the OTC is loosely structured.

The National Association of Securities Dealers (NASD), the self-policing body of the OTC, is now considering bids for a multi-million dollar computer system designed to speed trading. The log-jam in unlisted securities has plagued brokerage houses to the point where several no longer deal in nonlisted issues.

On June 13, when the market went through the ceiling and volume exceeded 21.3 million shares on the Big Board, it was virtually impossible to place orders for many unlisted stocks. The phones were jammed and dealers simply couldn't reach other dealers to make purchases.

The computerized system envisioned by the NASD for unlisted stocks would incorporate real-time computer operations and a nationwide television hookup of brokers and dealers.

The NASD system (called NASDAQ, the last two letters

standing for automated quotations) should be operational by 1970.

The way the OTC market works now is largely via telephone—dealers quote bid and asked prices and negotiate trades. Accordingly, the NASDAQ computer system is designed to operate on three levels:

1. NASDAQ will supply current bid and asked quotes for any security registered in the system. Initially the quotations would be supplied through the more than 25,000 interrogation display units now in use.
2. NASDAQ will supply a complete list of market-makers (firms that buy and sell specific securities).
3. NASDAQ's third level permits market-makers to enter, change or update bid and asked prices.

It is expected that about 2,000 issues will be covered under NASDAQ's level I.

THE BROKERAGE HOUSE — "THE COMMUNICATIONS REVOLUTION"

The communications revolution in stock transactions may be partly responsible for the enormous volume clogging securities markets. "Never before," as the New York Times Terry Robards said, "has so much information about the stock market been available to so many persons so quickly."

- Item: Bache & Co. spent $700,000 to install a new communications center at its 35 Wall Street headquarters.
- Item: Merrill Lynch, the largest brokerage firm, has installed nearly 1500 electronic desk-top quotation devices in its offices.
- Item: Bunker-Ramo has 12,000 Telequote devices in use. (The first one wasn't sold until 1964.) And Ultronic Systems installed 10,000 of its stockmaster desk-top units.

Computer usage in the brokerage house is playing a significant role in the communications revolution on two levels —back office operations and stock analysis applications.

THE BACK OFFICE

Just last August, the first use of computers to automatically "match-up" orders and executions in the buying and selling of stocks was announced by Goodbody and Company, one of Wall Street's pioneers in the use of computers.

The novel system marked a significant breakthrough in the automation of stock market transactions and results in faster, more accurate service to customers. The computer system eliminates more than 50,000 manual steps in Goodbody's back office on a busy day, a major step toward relieving the clerical log-jam that has forced leading securities markets to close on Wednesday during the summer.

As a result, Goodbody's 99 offices from coast-to-coast receive notification by automatic teletypewriter of a purchase or sale in two to five seconds after it has been reported by one of the firm's floor clerks on the New York or American Stock Exchanges.

Most large brokerage firms installed computer systems three or four years ago to automate "order switching." (This permits a buy or sell order originating at any point in a firm's network to go directly, via electronic data processing channels, to the appropriate broker on the floor of the exchange.)

But until now the return portion of the process has been manual. After the broker executed the order it was necessary to transmit details by wire to clerks at the central office wh checked its origin, made notations necessary for bookkeeping purposes, and then, by manual teletypewriter, notified the office of origin that the transaction was complete, and at what price. The new computer system eliminates seven of the steps required, three of which involved copying the orders.

In another important function, the new system at the end of each working day will automatically produce information in the form needed for computerized bookkeeping and billing.

Expressing his opinion of the new system Harold P. Goodbody, managing partner of the firm said: "We are delighted with the internal advantages we get from the expanded automation, but most of all we are pleased that it will improve customer service and cut down the number of clerical errors which invariably swell when we hit peaks in market volume."

ANALYZING STOCKS

Although the brokerage firm's utilization of computers is largely limited to internal and back-office operations—such as payroll, margining, bookkeeping, order confirmation and monthly client statements—many firms are tapping the computers potential power to analyze stocks and manage portfolios.

The ability of computers to rapidly select and relate larg masses of mathematical data continues to fascinate even experts who have been working with electronic data proc-

essing for years.

At Walston and Company, a securities house with offices coast-to-coast and overseas, computers are being used to analyze stocks both fundamentally and technically thereby advising its customers better about which stocks they should buy and when they should buy them. Fundamental analysis means purchasing stocks based on empirical data about the company in question—management, assets, earnings, dividends, competition, industry, etc. In making this type of analysis, the computer supplies data that in the past, the security analysts had to dig up through arduous research. This frees the analysts to proceed with more creative endeavors in the investment field.

Technical analysis is more of a day by day record keeping chore. Computers record such things as daily prices and trading volumes of stocks and then predict whether the price will go up or come down under specific market conditions.

At many of the top brokerage houses throughout the country the computer is fast becoming the "right-hand-man" of the security analysts and accounts executives alike. Last month, Walston announced "research evaluations" are available on some 1400 stocks, thanks to its new computer equipment. A company spokesman stated, "An account executive in any one of our 103 offices can find out in seconds what our research analysts—both fundamental and technical—think about these stocks."

Many of the experts still view computer usage in this area as being in the development stage. Long term hopes run high. Like other investment firms, Paine, Webber, Jackson & Curtis looks to the computer as a highly sophisticated research tool. It recently used its computer to produce a 30 page study on a projected 10 year analysis of the construction industry. According to Robert B. Johnson, Director of Research, "The study would have been physically impossible without the aid of the computer."

Hayden Stone, Inc. has developed a computer program for fundamentally appraising 900 common stocks. In addition, the firm uses another computer system for direct access to information on 3,000 stocks for technical consideration.

HARNESSING THE POTENTIAL

For years CUC has been active in harnessing the computers potential power in the financial field. In the early 1960's, in the areas of corporate and mutual fund management, CUC developed computer systems to produce a variety of stockholder lists which could be broken down into such categories as geographic area or number of shares held. The CUC system also provided statistical analysis by geographic area and type of ownership, such as individual, joint, trust funds and so forth. More recently, CUC has been involved in stock calculation programs, processing accounting transactions for mutual funds, stock evaluation and analysis, investment plan system analysis and stock purchase plan systems.

One interesting application recently completed is CUC's Stock Transfer Package. The CUC stock transfer package is a comprehensive system designed for use by all transfer agents. It has flexibility in that: inquiries and statistical data may easily be extracted from the system. Areas covered within the system are inclusive of all audit and stock transfer requirements and fall into the following categories: 1) conversions 2) maintenance 3) daily transactions 4) cyclical reports 5) inquiries and special reports.

THE FUTURE

What the future will bring is hard to predict. Historically, Wall Street has moved slowly. But like the times, it has changed drastically in the last decade to adjust to increasing demands placed on it by the financial community. There are now more than 24 million people in this country who own shares of stock in publically owned corporations—and they're growing at a rate of one million a year. One out of every six adult Americans owns a share of American business. Shareownership has tripled in the past 15 years. And there is no relief in future predictions. In late 1965 a Stock Exchange study projected that by 1975 there will be 30 million shareowners in America. Other less conservative estimates run as high as 45 million.

The communications-computer revolution is having tremendous effects on finance. The computer is now an integral tool of the financial world as it is in business and government. However the present applications of computers are only chipping away at the vast potential that is the future.

James McDonald is Vice President and Northeast Regional Manager of CUC. He is a graduate of Carleton College and holds an M.B.A. from Harvard Business School. He has been in the data processing field since 1956.

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