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THE PERSONAL COMPUTER INVESTMENT HANDBOOK

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PORTFOLIO MANAGEMENT AND ANALYSIS
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THE FUTURE

BY JON ZONDERMAN

THE PERSONAL COMPUTER INVESTMENT HANDBOOK

BY JON ZONDERMAN

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THE PERSONAL COMPUTER INVESTMENT HANDBOOK

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Introduction

In the past five years, the phrase "personal computing" has taken on new meaning. With the introduction of desktop computers available at prices most middle-class consumers can afford, the power of the computer is available to all.

When Apple Computer Company and other innovators in the personal computer world began introducing desktop computers in 1977 and 1978, their advertising and marketing people tried to convince Americans that personal computers would soon be used to perform a myriad of household functions.

This proved not to be, and by 1979 personal computers were being marketed as business-oriented tools. Today, while the majority of PCs are still being sold to business users, we are seeing a re-emergence of activity in the household market. Yet the list of household chores computers can perform remains paltry and is mostly limited to game playing, running education programs for reinforcement of what children learn in school, some data-base management tasks such as organizing the recipe book or cataloging the library, and some simple home financial management. The computer still cannot—or at least cannot *effectively* and *inexpensively*—control the heat, turn on the coffeepot in the morning, run the security and fire alarm systems, and do an ongoing energy audit.

One area of home use in which the computer *has* gained a prominent place is investment decisions. *The Personal Computer Investment Handbook* is designed to help you understand how the personal computer can be employed in investing and the history of the computer-investing movement.

This book is for the individual investor, regardless of how much money he or she has invested. The theories—both of investing and of computing—are the same regardless of your

stake in the financial markets. The way you apply those theories and the amount of time, effort, and money you spend in the attempt to maximize your investments will depend on how you view your investing: as hobby, avocation in the hopes of making enough to make it a vocation, or merely computer game. Because you will have to make an initial investment in computer hardware and additional investments in software to become a computerized investor, you may find the money necessary to get involved in computer-aided investing is more than you can ever hope to make on investment returns.

You may decide that scratch paper and calculator will continue to suffice. There are some other ways around the cost issue. You can write your own programs or copy some of the "public domain" software that exists through computer user and investment groups. In the future, given changes in current copyright laws, there is even the possibility of software sharing.

This book will not attempt to teach you how to program computers to do investment decision programs. Nor will it attempt to teach you all there is to know about investment theory. It will give you a rudimentary understanding of the various types of investments that can be entered into by an individual and of how to analyze possible investments. There are many good books on investment theory and an increasing number of information sources becoming available for those who would like to learn about programming simple investment-oriented programs. Some of these are listed in Appendix B.

I will concentrate on software that is commercially available. At the end of many of the chapters will be lists of software to perform the tasks described in the chapter: fundamental analysis of stocks, technical analysis, bond analysis, analysis of stock options and financial futures, and analysis of commodities. There is also a list of programs to help manage and analyze your portfolio. These lists are as comprehensive as possible, although new programs are being marketed all the time. The prices listed as well as the types of computers each program runs on are current to December 1983. I have not personally tested all of the programs listed, and much of the material about them comes from the companies' promotional literature.

This book will deal only with financial investments, not with hard assets such as gold, art, and collectibles. So far, the only hard asset that computer programs have been designed to analyze is real estate. Although there are many programs for analyzing the real estate market, it is so different from "paper" investments that it falls far beyond the scope of this book.

This book will not deal with the increasing number of personal computer programs that assist in tax record-keeping and tax preparation or with home financial management programs. Although many of the portfolio management programs discussed take into account the tax consequences of various investment decisions, they are not primarily concerned with taxes.

In addition to the discussion of how personal computers are used for individual investors to analyze various markets and to manage their portfolios, the final two chapters of this book deal with how the personal computer has affected and will affect the broader investment world. Chapter 12 discusses the brokerage industry and how the personal computer is turning it upside down. Chapter 13 takes a brief look at some of the new technological breakthroughs of Artificial Intelligence and Local Area Networks that could add other dimensions to the personal computer and the investing field in the next decade or two.

In short, this book is a primer for the

personal investor who wants—in fact, *needs*—to understand how his or her life will be changed as we approach the 21st century.

This book will incorporate some of my own biases with regard to both investing and computing. I will always endeavor to present all possible approaches to a problem. There will, no doubt, be many who will disagree with my notions of computers, investments, and where we are going in the future.

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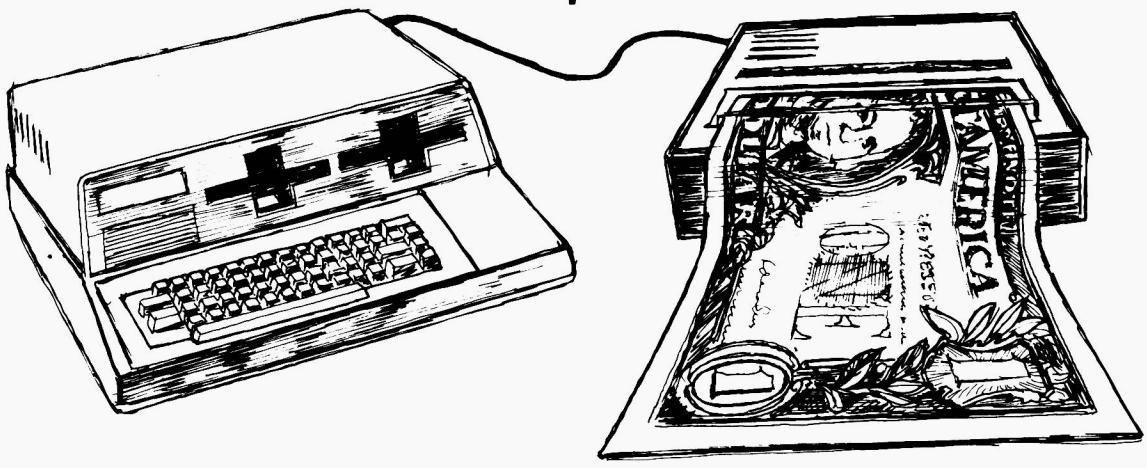
Chapter 1



In the Beginning

"As time goes on we are going to rely less and less on our feelings. We will instead feed data into computers and the computers will analyze it. The catch is, what data will we put into the computers?"

Isaac Asimov, the noted scientist, science fiction author, historian, and man-of-letters asked this not-so-rhetorical question on December 8, 1983, at Impact 84, a meeting and exposition for investment professionals sponsored by *Wall Street Computer Review*. In his glib way, Asimov, in his luncheon address to the members of the audience—investment software makers and dealers, brokers, bank trust officers, private money managers, and a few individual investors—captured the central irony about the computer age and the aspect of computers most misunderstood by the public at large. Computers neither think nor create the data they use. They are only as good as the data stored in their memory and the ways they have been programmed to manipulate that data.

Asimov recounted to his listeners the idea behind one of his masterpieces of science fiction, the *Foundation* trilogy. *Foundation's* premise is this: A prior civilization has destroyed itself. The computers that have been developed over the years by the three major powers that make up the civilization—computers that have been programmed to determine what each major power should do in the economic realm—begin collaborating, taking the human element out of international—indeed intergalactic—decision-making. Now the new civilization is spawning, and Harry Seldon tries to devise a system of analyzing past and present human experience so that the rulers of the new civilization will be more efficient. All human behavior is averaged so that neither a saint nor an abomination can skew the overall chart. No one is allowed to

know that he or she is being watched and analyzed, for fear that he would then behave unnaturally—like a person who senses his picture is about to be taken at a party or people who are at an event where there are television cameras. After conducting his analysis of billions of bits of historical and contemporary human behavior, Seldon devices the study of "psychohistory." Given any hypothetical situation, Seldon could predict the response of individuals, nations, worlds, and even galaxies.

Just as he was in danger of losing his audience of hard-driving, bottom-line-oriented money people, Asimov made the connection between his nearly 40-year-old literary triumph and the topic at hand. "What information is necessary for computers to analyze Wall Street?" he asked. Then, answering his own question, he stated:

"They have to know everything about human beings. There isn't anything human beings can do that doesn't affect the markets. It is impossible to do a proper job of computerizing the investing without computerizing humanity. We're going to end up not just with a program to analyze the stock market, but we're going to end up with psychohistory. Anything that can reduce Wall Street to calculations and logical analysis will reduce humanity and its emotions to calculations and logical analysis."

While psychohistory and perfect analysis are, most likely, going to remain forever in the imaginations of men like Asimov and on the pages of books such as the *Foundation* trilogy, it is obvious that since the dawning of the computer age—roughly 30 years ago—quantification of the behavior of markets, if not people, has become more refined. This has led us to a new age for investors—an age that is both exciting and frought with peril, a field loaded with creative tension and mined with apprehension. New methods of gambling on the financial and economic future of the world are being devised every day; new sources of information are becoming available. Deregulation of the financial services industry is diversifying the information sources open to individual investors, and the downward trend in prices of computers is making them increasingly more accessible to all.

But there is also an increasing danger that the investor will lose sight of the forest for the trees—lose sight of his or her investment goals and be devoured by the myriad of opportunities to make (and lose) money playing what is increasingly becoming one gigantic crapshoot.

Of Markets and Micros: Markets

Investing has long been one of America's favorite pastimes. Companies looking to put their spare cash to work for a short while, pension funds seeking to parlay worker contributions into more money for future retirees, and individuals—those who seek to establish a nest egg for later life and those who like the gambling aspect of investing—each year trade billions of shares in America's corporate wealth.

They do this investing in a number of different ways, through a number of different vehicles, and there are probably only a few of us alive who do not own—however indirectly—some corporate wealth. Our banks invest in short-term commercial paper; our insurance companies own massive portfolios, as do our pension funds.

There is, to be sure, no way to make your money grow without investing it. From the first person who realized that he could lend spare cash to someone else and get more back at a later date, to the world's first bankers, to those who began a business and sold stock in it, through the bubbles and pyramids and runups

and pools of history, past the Medecis, the Rothchilds, the Rockefellers, and the Ponzis, people have been trying to increase their wealth by investing it in businesses, governments, banks, insurance, and a variety of other schemes, scams, and games.

Your checking account—if you have a NOW account—is an investment, as is your house, the silverware you use at holiday dinners, and the art that hangs on your walls. But for the sake of this book, we will discuss only *financial* investments—paper investments that represent shares of businesses, governments, or future production and refinement of natural resources. The markets we will discuss at greatest length are the *stock* market, the *bond* market, the market for *options* on stocks and stock indexes, and the *commodities* markets, where contracts for future delivery of raw materials are made.

These markets offer different risks and rewards. Bonds pay a fixed rate of interest—sometimes without federal and/or state tax on the return—and hence have modest swings in open-market price. Stocks often have a dividend payment as well as the opportunity to appreciate or depreciate more wildly on the open market. Options are used as a tool by both speculators in search of fast money and hedgers who want to protect an investment. Commodities provide much the same type of market as stock options.

The market most people know the most about is, no doubt, the stock market. At a certain point in the life of many companies, they get so big that family or "closely-held" ownership cannot provide the money needed to keep the business going. A company may find its market increasing so fast that it needs more manufacturing space and component parts than private financing—through individual investors and loans—can accommodate. At this point the company engages in an "initial public offering," selling stock either held by the company or by original investors to the public to provide capital for future expansion. Pressure to "go public" also comes from those who put up the original capital to begin the business, who often do so with the idea that the company will eventually sell stock to the public and the value of their percentage of the company will be increased dramatically. Stock, therefore, is a small piece of ownership in the company issuing it, and is also known as *equity*.

After this initial public offering, investors are no longer buying stock from the company or from the original investors and owners, but instead from one another on the open market. This occurs either through a central exchange such as the New York Stock Exchange or American Stock Exchange, or through the so-called "Over-the-Counter" markets. Once the stock is on the open market, changes in price have as much to do with what people think the market will do in the future as it does with what people think the company will do in the future. The stock market also fluctuates with the fortunes of other investment markets and with rumor and speculation about the economy and world events. Since the options market is predicated on the underlying stock values in the stock market, these two markets move somewhat in tandem.

The bond market is affected by a more narrow range of factors, since bondholders are creditors—a bond is actually an IOU for the face value, payable at a certain date in the future, with the promise that interest on the loan will be paid regularly. Bondholders, therefore, are not equity owners but merely creditors. In the case of the financial failure of a company, bondholders would be paid before stockholders. In a similar way, short-term fluctuations in a company's fortunes do not send the price of bonds in that company nosediving like stocks, because the bond-

holders are more confident that the money will continue to be in the company coffers to meet the bond obligations.

The bond market is more significantly affected by the interest rate, the rate that must be paid to borrow funds. Bonds that pay lower interest are considered inferior investments if there are bonds issued—either in the same company or in different companies—that pay higher interest.

Commodity markets are affected by all sorts of vagaries such as the weather in regions of the world where resources are, as well as other matters that influence supply and demand.

But let's get back to the stock market for a moment, because that is where the majority of trading action is, especially among small investors. It is also the market that the majority of computer software is designed to deal with, although there is some software that can be used to analyze more than one market.

Investors and Speculators

When investors work to determine how to invest their money, a number of factors come into play. But when these factors are reduced to the lowest common denominator, the name of the game is *risk versus reward.* How much risk do I want to incur in an effort for great reward versus how much steady reward do I want for as little risk as possible? Is $5,000 in a bank account earning nine percent better than the same $5,000 in stocks, or a tax-free bond, or a contract to buy winter wheat? Is $5,000 in the stock market better off in AT&T or spread out over five growth stocks?

The decision has a lot to do with your basic theory of investing. *Investing* in its most narrow meaning is the preservation of capital and the accumulation of added wealth—making your money grow—at a steady, if not great, rate. This is the conservative definition, and conservatives define all the fast-paced, high risk/reward methods of investing as *speculation.*

Many people get into investing in the conservative sense only to be caught up in what many experts see as the gamesmanship of investing; they gradually broaden their definition to include things that, only a short time before, they may have considered purely speculative forms of gambling—buying soybean contracts, high-technology stocks, etc. This happens to investors who do their own decision-making as well as to those who have their investments managed by a money manager, by putting them into a *mutual fund* (otherwise known as an *investment company*) with a stated investment goal, or by giving their brokers discretion to manage their accounts.

As "Adam Smith" (the pseudonym for George Goodman, a long-time Wall Street honcho) wrote in his 1967 *The Money Game*:

"If you are a player in the Game, or are thinking of becoming one, there is one irony of which you should be aware. The object of the Game is to make money, hopefully a lot of it. And the players in the Game are getting rapidly more professional; the amount of sheer information poured out on what is going on has become almost too much to absorb. The true professionals in the Game—the professional money managers—grow more skilled all the time. They are human and they make mistakes, but if you have your money managed by a truly alert mutual fund or even by one of the better banks, you will probably have a better job done for you than at any time in the past."

One of the reasons for this increase in the amount of information available and the increase in professionalism on the part of money managers, Smith theorized, was the growth in use of large computers to both store data and

crunch numbers as part of the money manager's analysis.

In addition to increasing the ability of money managers to do detailed, careful analysis and accumulate more information more quickly, Smith also argues that the rise of the mainframe computer changed the complexion of investing—along with other factors in the post-Word War II economy of the United States.

In the 1960s, partially because of the computer and the confidence it gave money managers in following more stocks, getting more information about each company, and doing faster analysis, the name of the Game changed. Prudence gave way to performance. Mutual funds were rated each year for their performance, and money managers were chosen by individual clients on the basis of how "go-go" they had been, not how steady. A 50 percent increase in the value of one's holdings in one year was better than five consecutive 10 percent increases, many investors felt. As Smith writes:

"For years, it didn't matter that the managers had taken over. The portfolio was not yet an Instrument of Personality. The Portfolio Manager was instructed to leave speculation to the speculators; he was participating in the Long-Term Growth of the American Economy. His portfolio had two hundred stocks, and they were the two hundred biggest companies in America. The two hundred stocks were only two-thirds of the portfolio; the other third was bonds. The portfolio manager's charter came from an ancient case, Amory vs. Harvard College, 1831, which ruled that a fiduciary act 'as would any Prudent Man.' To be a Prudent Man, one preserved capital, one was conservative, one ate breakfast, lunched at the Club, and died with an estate that won the admiration of the lawyers for its order and efficiency. The Prudent Man managing securities did his business with his classmates who happened to be brokers, and in a radical move he might reduce Steels from 3.3 percent to 2.9 percent of the portfolio, and buy a little more telephone."

Smith's glibness hides a very important point: As computers entered the fray and computing power—both in terms of information storage and numbers crunching—became worth money, the Game changed from one of steady growth with a little on the side for a speculative venture to one of trying to find something that was, in the words of the brokerage profession, "going to pop" and finding out about it before everyone else did. Money managers and mutual fund managers tripped over each other trying to get at "good things," and as the tools of the trade—computers and the analysis tool that they used—became more widely disseminated in the money management community, it became harder and harder to beat the other players to the real deals.

Of Markets and Micros: Micros

Whatever the strategy, the key to investment management is *information*. And until recently, large investment houses and financial institutions, with bullpens of researchers and powerful mainframe computers, were able to keep track of and determine the quality of far more investment possibilities than any individual or small shop—usually working with pencil and paper, or at best constrained to the financial limitations of time-sharing on a large computer system—could ever dream of.

But the microcomputer—or personal computer, as individuals are wont to call it—is rapidly diminishing the large company's advantage. With increasingly sophisticated software packages and access to electronic databases replete with the latest financial news, prices, required filings to the Securities

and Exchange Commission, and macroeconomic forecasting, microcomputer users are rapidly becoming serious players in the Game. Personal computers are, in short, democratizing the Game.

Personal computer users from both major schools of investment analysis—technical analysis and fundamental analysis—now have a full line of software to increase the information they receive and allow them to characterize that information in ways they are most accustomed to dealing with.

Adherents of *technical analysis* believe that an investment's past performance with regard to volume and price will determine how it will move in the future. Disciples of the *fundamental analysis* school believe the markets react to outside influences that are often found in the miniscule headlines on the back pages of newspapers or lost in the news processing business altogether—items that tell of a drop in earnings at the company, a shakeup in management, or such positive news as a new product or that the company has taken a larger market share against a major competitor. While many hard-core technical analysts—often called *chartists*—concern themselves only with the statistical information, some limit themselves to following the charts of companies they find fundamentally sound. Many fundamental analyists, once they have decided what company to invest in, then chart the stock's past performance, looking for a soft spot to make a purchase below the point where the investor thinks the stock's intrinsic value lies.

There is also a third theory of investing, the "Random Walk" or "Efficient Market." Adherents to this theory believe that if you pick stocks by sticking a pin in the New York Stock Exchange chart in the daily newspapers every three months and buying that stock, then hold the stocks for a few years each, your portfolio will perform as well as an actively managed one—either a technical or fundamental analyst's—over the long haul. These people obviously have no need for computer software to help them in their decision-making.

What takes a computer seconds would take an investor working by hand hours. Gathering statistical data on a potential investment's past performance and putting those statistics into a manageable form—usually a graphic representation—is only the first step. Keeping files on companies, including these charts, newspaper clippings, prospectuses, and other pertinent data is a nearly impossible task for an individual. Even the most diligent investor is missing information. Under the rules of the Securities and Exchange Commission and other federal government agencies, companies are compelled to disclose enormous amounts of information. The Dow Jones News Service collects this information, but only a fraction gets into the *Wall Street Journal*, much less metropolitan newspapers or wire services. It does, however, stay in the news service files long enough to be read by a personal computer user who has access to the Dow Jones News/Retrieval Service.

The current investment software for personal computers falls into a number of categories. There is software to do fundamental analysis—to screen possible investments for a broad array of fundamental criteria. There is software (an abundance of it) for technical analysis, charting based on the most sophisticated and most obscure notions of important market indicators. There is software to analyze options, commodities, bonds, and convertible bonds (bonds that have a value if converted to stock as well as bonds). There are programs to keep track of your portfolio, including your sales, purchases, gains, losses and all the associated tax consequences. There