Toward a Science of Security Analysis

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THE SCIENTIFIC METHOD

As H. D. Wolfe pointed out in his paper in the last JOURNAL (Science as a Trustworthy Tool)[1], scientific method includes among its factors the wide observation and recording of events, the construction of rational and plausible theories or formulas, and their validation through the medium of reasonably dependable predictions. There are many varieties of scientific or quasiscientific disciplines, and the character of the predictions based on them will vary greatly from one to another.[1]

At one extreme take the microphone. An electrical engineer, having rigged it up carefully, can predict that a word spoken into it will be immediately amplified. The prediction is precise; the verification prompt and unquestionable. At the other extreme let us take psychoanalysis—a discipline sometimes compared with our own security analysis. Here prediction and verification are less definite. A layman who finances psychoanalytical treatment for one of his family is apt to be slightly in the dark about such details as the nature of the illness, the method and duration of the treatment, and the extent of the cure, if any. About the only thing he can predict with certainty is how much it will cost per hour. Between these two extremes lies actuarial science, which to my mind is more relevant than the others to the scientific possibilities of security analysis. The life insurance actuary makes predictions concerning mortality rates, the rate of earnings on invested reserves, and factors of expense and profit—in all instances based largely on carefully analyzed past experience, with allowance for trends and new factors. Out of these predictions, with the aid of mathematical techniques, he fashions suitable premium schedules for various types of insurance. What is most important for us about his work and his conclusions is that he deals not with individual cases but with the probable *aggregate result* of a large number of similar cases. Diversification is of the essence in actuarial science.

Thus our first practical question about "scientific security analysis" is whether it is actuarial in character, and has diversification as its essential ingredient. One plausible answer may be that diversification is essential for certain types and objectives of security analysis but not for others. Let us classify the things that security analysis tries to do and see how the element of diversification applies to each. At the same time we may raise other questions concerning the scientific methods and predictions operating in each of the classes.

I suggest that the end product of our work falls into four different categories, as follows:

1. The selection of safe securities, of the bond type.
2. The selection of undervalued securities.
3. The selection of growth securities, that is, common stocks that are expected to increase their earning power at considerably better than the average rate.
4. The selection of "near-term opportunities," that is, common stocks that have better-than-average prospects of price advance, within, say, the next 12 months.

This list does not include stock market analysis and predictions based thereon. Let me comment briefly on this point. If security analysis is to be scientific, it will have to be so in its own right and not by depending on market techniques. It is easy to dismiss this point completely by saying that, if market analysis is good, it doesn't need security analysis; and, if it isn't good, security analysis doesn't want *it*. But this may be too cavalier an attitude toward an area of activity that engages the interest of a host of reputable security analysts. That stock market analysis and security analysis combined may be able to do a *better* job than security analysis by itself is at least a conceivable proposition and perhaps a plausible one. But the burden is on those who would establish this thesis to demonstrate it to the rest of us in unequivocal and convincing fashion. Certainly the published record is far too meager, as yet, to warrant conceding a scientific standing to a combination of the two analyses.

FOUR CATEGORIES

To return to our four categories of security analysis, choosing safe bonds and preferred stocks is certainly the most respectable if not the most

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exciting occupation of our guild. Not only has it major importance of its own, but also it can offer useful analogies and insights for other branches of our work. The emphasis of bond analysis is on past performance, tempered by a conservative view of future changes and dangers. Its chief reliance is on a margin of safety that grows out of a small ratio of debt to total real value of the enterprise. It requires broad diversification to assure a representative or average over-all result. These viewpoints have made bond investment, as practiced by our financial institutions, a soundly scientific procedure. In fact, bond investment now appears to be almost a branch of actuarial science. There are interesting similarities (as well as differences) between insuring a man's life for $1,000 against a premium of $34 per year, and lending $1,000 on a long-term bond also paying $35 per year. The calculated mortality rate for men aged 35 is about 4 out of 1,000, or 4/10% per year. A comparable "mortality rate" might be applied to corporate enterprises in the best financial and operating health, to estimate the risk attaching to high-grade bond investment. Such a figure, say 1/2%, might then properly measure the risk and yield differential between the strongest corporate bonds and U. S. Government obligations.

BOND INVESTMENT: A SCIENTIFIC PROCEDURE

Bond investment should take on more of the character of a scientific procedure when the monumental corporate bond study, carried on by the National Bureau of Economic Research and other agencies, is finally completed and the mass of statistical data and findings is made available to security analysts. The greatest weakness of our profession, I have long believed, is our failure to provide really comprehensive records of the results of investments initiated or carried on by us under various principles and techniques. We have asked for unlimited statistics from others covering the results of their operations, but we have been more than backward in compiling fair and adequate statistics relating to the results of our own work. I shall have a suggestion to make on that point a little later.

SELECTION OF UNDERVALUED SECURITIES

The selection of undervalued securities appears next on my list because of its logical relationship to investment in safe bonds or preferred stocks. The margin-of-safety concept is the dominant one in both groups. A common stock is undervalued, typically, if the analyst can soundly establish that the enterprise as a whole is worth well above the market price of all its securities. There is a close analogy here with bond selection, which also requires an enterprise value well in excess of the debt. But the rewards for establishing that a common stock is undervalued are, of course, incomparably greater; for in the average case all or a good part of the margin of safety should eventually be realized as a profit to the buyer of a truly undervalued issue.

In this connection I want to throw out a broad and challenging idea—that from a scientific standpoint common stocks *as a whole* may be regarded as an essentially undervalued *security form*. This point grows out of the basic difference between individual risk and overall or group risk. People insist on a substantially higher dividend return and a still larger excess in earnings yield for common stocks than for bonds, because the risk of loss in the average *single* common stock issue is undoubtedly greater than in the average *single* bond. But the comparison has not been true historically of a *diversified group* of common stocks, since common stocks as a whole have had a well-defined upward bias or long-term upward movement. This in turn is readily explicable in terms of the country's growth, plus the steady reinvestment of undistributed profits, plus the strong net inflationary trend since the turn of the century.

FIRE AND CASUALTY RATES

The analogy here is with fire and casualty insurance rates. People pay about twice as much for fire insurance as their own actuarially determined exposure would indicate—because they cannot soundly afford to carry the individual risk themselves. For similar reasons the overall return on common stocks appears to have been at least twice as much as their true overall risk has required. An interesting relationship at this point appears from the Keystone chart showing the trend of the Dow-Jones industrial average since 1899. Both the upper and lower lines happen to rise at the rate of one third every ten years. You will recognize this as the 2.90% rate of compound interest realized on U. S. Savings Bonds, Series E. What this means is the consistent Dow-Jones investor has obtained the same increase in *principal value* as the savings bonds offer in lieu of interest; and in addition the Dow-Jones stock investor has obtained all the annual dividends from his holdings as a bonus above the Government bond interest rate.

The reasoning I have just indulged in is, I

believe, both scientifically valid and psychologically dangerous. Its validity depends on the maintenance in the stock market of the substantial disparity between bond yields and the price-earnings ratios on stocks. If—as happened in the 1920s—this very thesis is twisted into the slogan that common stocks are attractive investments, regardless of how high they sell, then we would find ourselves beginning as scientists and ending as heedless and ill-starred gamblers. It may be a fair generalization to assert that the top levels of most "normal" bull markets are characterized by a tendency to equate stock risks with bond risks. These high valuations may indeed have some justification in pure theory, but the important thing for us to bear in mind as practicing analysts is that, when you pay full value for common stocks, you are in great danger of later appearing to have paid too much.

INDIVIDUAL UNDERVALUATIONS

Turning now to the field of *individual* undervaluations, we find ourselves on more familiar ground. Our work with this group readily admits of the scientific processes of wide observation and the testing out of predictions or hypotheses by their sequels. The theory of undervalued issues must necessarily require an explanation of their origin. The explanations are in truth quite varied and taken together form what may be called a "pathology of market prices." They range from obvious causes, such as an unduly low dividend or a temporary setback in earnings, to more subtle and special conditions such as too much common stock in the capital structure or even too much cash in the bank. In between lie numerous other causes such as the presence of important litigation, or the combination of two dissimilar businesses, or the use of the now discredited holding company setup.

ORIGINS OF UNDERVALUATION UNDERSTOOD

The origins of undervaluation are pretty well understood by now and could no doubt be set forth in an acceptably scientific study. We do not know as much about the cure of undervaluations. In what proportion of cases is the discrepancy corrected? How or why does the correction occur? How long does the process take? These questions remind us somewhat of those we raised about psychoanalysis at the outset. But one thing of importance we do know, and that is that the purchase of undervalued issues on a diversified basis does produce consistently profitable results. Thus we have a worthwhile field for more scientific cultivation. Here inductive studies carried on intelligently and systematically over a period of years are almost certain to be rewarding.

SELECTION OF GROWTH STOCKS

The third objective of security analysis is the selection of growth stocks. How scientific a procedure is this now, and how scientific can it be made to be? Here I enter difficult waters. Most growth companies are themselves tied in closely with technological progress; by choosing their shares the security analyst latches on, as it were, to the coattails of science. In the 40 or more plant inspections that are on your scheduled field trips for this convention week, no doubt your chief emphasis will be placed on new products and new process developments; and these in turn will strongly influence your conclusions about the long-pull prospects of the various companies. But in most instances this is primarily a *qualitative* approach. Can your work in this field be truly scientific unless it is solidly based on dependable *measurements*, that is, specific or minimum projections of future earnings, and a capitalization of such projected profits at a rate or multiplier that can be called reasonably conservative in the light of past experience? Can a definite *price* be put on future growth—below which the stock is a sound purchase, above which it is dear, or in any event speculative? What is the risk that the expected growth will fail to materialize? What is the risk of an important downward change in the market's evaluation of favorable prospects? A great deal of systematic study in this field is necessary before dependable answers to such questions will be forthcoming.

STOCK INVESTMENT IN PRESCIENTIFIC STAGE

In the meantime I cannot help but feel that growth stock investment is still in the prescientific stage. It is at the same time more fascinating and less precise than the selection of safe bonds or undervalued securities. In the growth stock field, the concept of margin of safety loses the clarity and the primacy it enjoys in those other two classes of security analysis. True, there is safety in growth, and some of us will go so far as to declare that there can be no real safety except in growth. But these sound to me more like slogans than scientifically formulated and verified propositions. Again, in the growth field the element of selectivity is so

prominent as to place diversification in a secondary and perhaps dubious position. A case can be made for putting all your growth eggs in the one best or a relatively few best baskets. Thus in this branch of security analysis the actuarial element may be missing, and that circumstance undoubtedly militates against truly scientific procedures and results.

INVERTED RELATIONSHIP

There is undoubtedly an organic but inverted relationship between the growth stock concept and the theory of undervalued securities. The attraction of growth is like a tidal pull which causes high tides in one area, the assumed growth companies, and low tides in another area, the assumed nongrowth companies. We can measure, in a sense, scientifically the distorting effect of this influence by using as our standard the *minimum business value* of enterprises in the nonfavored group. By way of illustration let us apply that thought to three California concerns. The shares of Roos Brothers, a local retail enterprise, will in the nature of things tend to sell below their analytically determined value for basically the same reasons that are bound to produce overvaluations in the shares of Superior Oil or Kern County Land.

I come finally to the standard occupation of brokerage house analysts and advisory services, namely, the selection of issues favorably situated for a near-term market advance. The usual assumption here is that, if the earnings will improve or the dividend will be raised, then the price will improve. Thus the process consists essentially of locating and recommending those companies that are likely to increase their earnings or dividends in the near term. You all know the three basic hazards encountered in this work: that the expected improvement will not take place, that it is already discounted in the current price, that for some other reason or for no known reason the price will not move the way it should.

It may be that despite these hazards it is possible to obtain worthwhile results on the average from competent short-term analyses and predictions. Who of us can say whether or not this is true? In view of the importance of this analytical work, in terms of time, energy, and money cost, it might not be a bad idea to subject it to a thoroughgoing evaluation.

SEARCHING SELF-EXAMINATION

This brings me to my conclusion and my one concrete proposal. Security analysis has now reached the stage where it is ready for a continuous and searching self-examination by the use of established statistical tools. We should collect the studies and recommendations of numerous analysts, classify them in accordance with their objectives (perhaps in the four groups suggested in this paper), and then do our best to evaluate their accuracy and success. The purpose of such a record would not be to show who is a good security analyst and who is a poor one, but rather to show what methods and approaches are sound and fruitful and which ones fail to meet the test of experience.

This suggestion was originally made in the articles published under the pseudonym of *Cogitator* in THE ANALYSTS JOURNAL six years ago. At that time I wrote: "It is unlikely that security analysis could develop professional stature in the absence of reasonably definite and plausible tests of the soundness of individual and group recommendations."[2] The New York Society is now taking the first positive steps to establish a quasiprofessional rating or title for security analysts who meet specified requirements. It is virtually certain that this movement will develop ultimately in full-fledged professional status for our calling. The time may well be ripe for the Federation and its constituent Societies to begin a systematic accumulation of case histories, which should make possible the transmission of a continuous, ever-growing body of knowledge and technique from the analysts of the past to those of the future.

When this work is well under way security analysis may begin—modestly, but hopefully—to refer to itself as a scientific discipline.

FOOTNOTES

1. H.D. Wolfe, "Science as a Trustworthy Tool," *The Analysts Journal* (March 1952):45-49.
2. Cogitator, "On Being Right in Security Analysis," *The Analysts Journal* (1st Quarter 1946):18-21, especially at p. 18 for quoted material.