Relative Velocity Statistics: Their Application in Portfolio Analysis

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Price fluctuations, it would seem, should be considered as a factor in the valuation of a stock or a portfolio of stocks. When an analyst has weighed all the other variables he is accustomed to employ in judging a security, there is in addition what might be called the technical factor. This factor is derived from the interplay of supply and demand, both at the time the appraisal is being made, and historically.

It is generally conceded that price fluctuation habits reflect such fundamental factors as type of industry, ability of management, financial structure, growth trend, profit margin, tax situation, earnings record, dividend record, et cetera. Of these, probably the most directly important to price movement is the earnings record, which of course also closely influences dividend record. But it is also true that other factors, such as shares outstanding, sponsorship, floating supply, public following and similar items have a bearing on price habits.

A knowledge of the influence of price fluctuations can and should become a very useful working tool of every security analyst. Usually, of course, the senior analyst acquires a "feeling" of price characteristics through many years of experience.

A very considerable amount of research points to the probability that measuring the influence of price *level* and price *fluctuations* alone, as separate factors, is almost an impossible task (see Table 1). However, decidedly useful results have been obtained in measuring the price *habits* which reflect all other forces that arise in the marketplace—fundamental as well as technical.

USE OF VELOCITY STATISTICS

Perhaps the best way to observe the influence of price fluctuation is by the employment of velocity statistics. The procedure is simple.[1] Indications are that it was first used in the late 1920s (by this

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author), and first publicized in 1932 by the late Robert Rhea.

Many thousands of velocity computations show that price movements of most individual stocks tend to swing between 50% and 300% of that of the market, although the recent specialty market has recorded velocity ratings much higher than 300 (300%) in a number of stocks—the rails being a notable example.

In order to obtain a useful velocity expectancy for an individual stock, a series of at least ten swings should be covered, and figures for advance velocity and decline velocity should be averaged separately and carefully compared, as illustrated in Table 1.

Is such a series of figures, accumulated over a period of time, an accurate guide to the expectancy of future moves? Long experience with the data indicates that they are useful and reliable—if their limitations are understood. Only a few stocks consistently turn in uniform figures; as noted above, a large number are fairly consistent. But there are also a number of issues for which the velocity figures show wide variations during successive swings, which reduce their reliability and usefulness. Thus it is necessary to know that a stock has or has not a consistent record in its price fluctuation habits.

GROWTH OR DECADENCE

Some stocks show widely varying velocity statistics for advances as compared with declines—or vice versa. In the former case, a growth situation is usually indicated, if the study being made goes back for any reasonable length of time, such as three to five years. Conversely, if velocity in declines consistently exceeds that in advances, it is often the reflection of a decadent trend.

It is also true that, except in the cases of very marked growth or decadent trends, a very high or very low velocity figure which occurs unexpectedly—in that it varies greatly from the previous average velocity—is likely to be followed by a comparably high or low figure in the succeeding

Table 1.

Name of Stock	Recent Price	1944 Volume Ratio*	Average Advance Velocity**	Average Decline Velocity**	Degree of Consistency†
Amer. Locomotive	33⅜	.410	276	232	Good
Byers, A. M.	19⅝	.061	242	199	Good
General Cable	7⅛	.087	336	306	Good
Allied Chemical	163½	.032	71	86	Good
Penney, J. C.	110	.035	68	60	Good
United Fruit	93½	.051	84	97	Good
Armour of Ill.	8½	.378	322	225	Poor
Bliss, E. W.	19⅞	.068	226	181	Poor
Natomas Co.	12¼	.053	89	107	Poor

* Volume ratio represents total 1944 trading for the individual stock, divided by total volume for the year on the New York Stock Exchange.

** The velocity figures shown here represent average figures covering respectively the eight advances and eight declines of intermediate amplitude from the September 1939 low (the beginning of the war) to the September 1944 low, five years later.

† In an astonishing number of cases, such as the three high-velocity and three low-velocity issues listed above, the velocity figures for the separate moves making up the average have a high degree of consistency. But there are some issues, usually of relatively low-price, whose expectancy is much less predictable, and whose average figures do not reflect any great consistency. These exceptions would show up in a detailed tabulation covering each individual swing.

swing. This phenomenon reflects merely the well-known principle of market action and reaction.

Velocity statistics are most useful and reliable when they are applied to a number of stocks in a single comparison—as for example, in measuring a portfolio containing a number of items. In fact, if the speculator or trader wants to use them as a measuring rod for the selection for faster-than-market situations, it is essential that such selection be spread over several issues, if the expectancy is to be relied upon.

APPRAISING POTENTIAL VELOCITY OF A PORTFOLIO

For the analyst dealing with portfolios, there is a method designed to show the velocity habits of the portfolio. Projection of the resultant data yields the expected behavior of the portfolio as a whole. After pricing the portfolio and extending the dollar amounts to reflect the number of shares owned, such extensions are then multiplied by the advance velocity figure for each individual stock, or the decline velocity figure, depending upon whether the determination is to be for an advance or a decline. An average velocity, derived from the sum of such velocity extensions, is the expression of the velocity habit of the portfolio.

In appraising a portfolio to reflect its potential velocity, one may carry the process a step further and calculate the percentage of market value of an issue, weighted to reflect its velocity, to the whole portfolio so weighted.

It is surprising to see the differences which sometimes show up in such calculations. A stock which might appear as 8% of the whole portfolio in terms of market value—when corrected for velocity expectancy—might turn out to have an influence amounting to as much as 12–15%, or as little as 3–5%.

Velocity figures should not be used unless, as previously observed, certain of their limitations are recognized. For example, a case involving a miscellaneous list of twenty-one stocks, when first studied and appraised on July 19, 1943, had a valuation of $248,000. Only seven of the stocks in the list would be considered of investment quality; the remaining issues ranged from moderately conservative to very speculative. At the time, the velocity of the whole portfolio measured 165 (the list had a performance expectancy of 165% of the market, on the upside.)

Let it be assumed that at the time the portfolio was appraised, the general market expectation was for a further rise of 10%. With a velocity of 165, this would mean that the portfolio, which then amounted to $248,000, might be expected to advance not 10%, but 16.5%, to a value of $288,920. In effect, the portfolio under study might be expected to produce profits equivalent to those produced by some other portfolio with a starting value of $262,654.54, but with a velocity of 100.

In examining that which actually happened between July 19, 1943 and the most recent date of appraisal, February 10, 1945, it was found that the net gain in the market between those dates was

14.61%. The portfolio, on the other hand, appreciated by 23.69%. Thus its velocity was 162—very close to its expectancy of 165. Actually, in examining the performance of each of the 21 stocks in this portfolio, it was found—as is sometimes the case—that only two issues closely followed their individual expectancies. Three of the investments showed losses in the period, and thus failed even to approximate their low velocity expectancies. At the same time, three speculative issues and one investment stock made only tiny gains, and considerably undershot their expectancies. To offset these, however, six of the speculative holdings which normally show relatively high velocities, developed excessively high velocities, and thus enabled the portfolio as a whole to live up to its velocity expectancy. This balancing out of expectancy is quite usual.

FOOTNOTE

1. First it is necessary to select some average or index to represent the market, such as the Standard & Poor's 90-stock Index, the Dow-Jones 65-stock Composite, or a more comprehensive measure such as the author's 276-stock Aggregate. Long experience has shown that not much is to be gained statistically, by comparing individual stocks with their major groups, rather than with a general average.

By tracing back the fluctuation pattern of the general average, the larger swings are selected (by inspection) and the successive high and low points are then used to compute percentage advances and declines. Although the general market trend may make the choice of smaller movements feasible, usually the swings selected are those of 10% or more. The percentage rise or fall of the average in a given swing is used as the base for the velocity observations of individual stocks in that period.

The next step is to compute the comparable percentage advance or decline of the individual stock in the swing. (Sometimes it is necessary to select an individual stock high or low which is as much as ten days away from that in the average, to obtain a true picture of its relative performance.) And finally, the percentage rise or decline in the individual stock is divided by the corresponding move in the base index, and multiplied by 100, to give the "velocity rating" of the stock.

For example, in the most recent rise from the September 1944 low to the early February high, the Gartley 276-stock Aggregate advanced from 8480 to 9907—a rise of 16.83%. The percentage figure is used as the base. During the same period, American Steel Foundries advanced from 23¼ to 31—a gain of 33.33%. This percentage rise in the individual stock (33.33%), divided by 16.83%, the corresponding rise in the general average, yields a performance of 1.98 times the market—or, multiplying by 100, 198 as a velocity rating of the stock.