Graham and Growth Stock Investing

Graham developed a formula and methodology for growth stock investing in the 1962 Edition of *Security Analysis (Chapter 39).*

First some background

A security should be analyzed independently of its price, and that the future performance of any security is uncertain. The risk and the return of the investment are dependent on the quality of the analysis and this "margin of safety."

The margin of safety implicitly reiterates that one can effectively assess the value of a security independently of the rest of the market. Graham's experience with gyrating expectations for the future led him to initially appreciate more stable evidence of value, such as marketable non-operating off balance sheet assets, over less tangible or less reliable sources of worth, such as future earnings growth.

Only later in his career (1962-1972) did he begin to focus on evaluating the long-term earnings potential of a company.

Graham's focus later on in his life came from his experience in purchasing **GEICO**. That single transaction, which accounted for about a quarter of his assets at the time, yielded more profits than all his other investments combined. He paid $7 per share for GEICO stock and watched it grow over the ensuing years to the equivalent of $54,000 per share. Graham's greatest profits ironically came from a growth company.

James J. Cramer, the street.com on 29th February 2000, "You have to throw out all of the matrices and formulas and texts that existed before the Web….If we used any of what Graham and Dodd teach us, we wouldn't have a dime under management."

Ben Graham, the Growth Stock Investor

Every investor would like to select the stocks of companies that will do better than the average over a period of years. A growth stock may be defined as one that has done this in the past and is expected to do so in the future.[1] Thus it seems only logical that the intelligent investor should concentrate upon the selection of growth stocks. Actually the matter is more complicated, as we shall try to show.

It is a mere statistical chore to identify companies that have "outperformed the averages" in the past. The investor can obtain a list of 50 or 100 such enterprises from his broker. Why, then, should he not merely pick out the 15 or 20 most likely looking issues of this group and lo! He has a guaranteed-successful stock portfolio?

[1] A company with an ordinary record cannot, without confusing the term, be called a growth company or a "growth stock" merely because its proponent expects it to do better than the average in the future. It is just a "promising company." **Graham is making a subtle but important point: If the definition of a growth stock is a company that will thrive in the future, then that is not a definition at all, but wishful thinking.** It is like calling a sports team "the champions" before the results are in. This wishful thinking persists today, among mutual funds, "growth: portfolios describe their holdings as companies with "above-average growth potential" or "favorable prospects for earnings growth." A better definition might be companies whose net earnings per share have increased by an annual average of at least 15% for at least five years running. (Meeting this definition does not ensure that a company will meet it in the future.)

There are two catches to this simple idea. The first is that common stocks with good records and apparently good prospects sell at correspondingly high prices. The investor may be right in his judgment of their prospects and still not fare particularly well merely because he has paid in full and perhaps overpaid for the expected prosperity. The second is that his judgment as to the future may prove wrong. Unusually rapid growth cannot keep up forever; when a company has already registered a brilliant expansion, its very increase in size makes a repetition of its achievement more difficult. At some point the growth curve flattens out, and in many cases it turns downward.

Ben Graham: "The risk of paying too high a price for good-quality stocks—while a real one—is not the chief hazard confronting the average buyer of securities….the chief losses to investors come from the purchase of low-quality securities at times of favorable business conditions."

*If we are to begin a study of **how to value growth** let's start by reading what the "Father of Value Investing," Ben Graham, has to say.*

Source: *Benjamin Graham and the Power of Growth Stocks* by Frederick K. Martin, CFA

Preface to Security Analysis, 4th Ed.)

…certain criteria of a "reasonable price" at which a given common stock or group of stocks might be bought for investment. These criteria took into account the side fluctuations of former stock markets; they leaned heavily on average earnings for a number of past years; they established upper limits for a permissible price in relations to such earnings. Favorable possibilities of future growth were to be looked for and taken advantage of when feasible; **but the investor—as distinguished from the speculator---was to keep the premium paid for such prospects within a modest maximum.** We did not claim that these conservative criteria of "value" or "justified price" proceeded from mathematical laws or other a priori principles. They were definitely *empirical* in their origin.

…At this point we should add a word of caution. We believe that there are sound reasons for anticipating that the stock market will value corporate earnings and dividends more *liberally* in the future than it did **before 1950**. We also believe there are sound reasons for giving more weight than we have in the past to measuring current investment value in terms of the **expectations of the future**. But we recognize that both views lend themselves to **dangerous abuses**. The latter has been a cause of excessively high stock prices in past bull markets. However, the danger lies not so much in the emphasis on future earnings as on a **lack of standards** used in **relating earnings growth to current values**. Without standards no rational method of value measurement is possible.

…As we stated in our preface, the greatly enhanced investment standing of common stocks at the beginning of the 1960's presents us with vexing problems when we come to reformulate our criteria of value.

Jason Zweig: *Graham said that investors should stay away from growth stocks when their normalized P/Es go above 25. On the other hand, when the product of a stock's normalized P/E and its price-to book*

ratio is less than 22.5—Normalized P/E x (price/book) is less than 22.5—it is at least a good value. So, if a normalized P/E is below 14 and the price/book is below1.5, the stock should be attractive.

One of the common criticisms made of Graham is that all the formulas in the 1972 edition of The Intelligent Investor are antiquated. The best response is to say, "Of course they are!" Graham constantly retested his assumption and tinkered with his formulas, so anyone who tries to follow them in any sort of slavish manner is ***not doing what Graham himself would do,*** *if he were alive today.*

Graham displayed extraordinary skill in hypothesis testing. He observed the financial world through the eyes of a scientist and a classicist, someone who was trained in rhetoric and logic. Because of his training and intellect, Graham was profoundly skeptical of back-tested proofs. And methodologies that promote the belief that a certain investing approach is superior while another is inferior. His writing is full of warnings about time-period dependency….Graham argued for slicing data as many different ways as possible, across as many different periods as possible, to provide a picture that is likely to be more durable over time and out of sample.

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Now we want to hear what Ben Graham has to say about valuing growth. Graham later described his way of thinking as "searching, reflective, and critical." He also had "a good instinct for what was important in a problem….the ability to avoid wasting time on inessentials….a drive towards the practical, towards getting things done, towards finding solutions, and especially towards devising new approaches and techniques." (Source: *The Memoirs of the Dean of Wall Street*, 1996). His famous student, Warren Buffett, sums up Graham's mind in two words: "terribly rational."

Graham in the *Preface to Security Analysis, 4th Edition*

We believe that there are sound reasons for anticipating that the stock market will value corporate earnings and dividends more *liberally* in the future than it did **before 1950**. We also believe there are sound reasons for giving more weight than we have in the past to measuring current investment value in terms of the **expectations of the future**. But we recognize that both views lend themselves to **dangerous abuses**. The latter has been a cause of excessively high stock prices in past bull market. However, the danger lies not so much in the emphasis on future earnings as on a **lack of standards** used in **relating earnings growth to current values**. Without standards no rational method of value measurement is possible.

Editor: Note that when Graham wrote those words (1961/62) the bond yield/stock yield ratio was changing. In the early 1940s and 1950s for example, stock dividend yields were fully twice AAA bond yields, meaning that investors were only willing to pay half as much for one dollar of stock income as they were willing to pay for one dollar of bond income. In 1958, however, stock and bond yields were equal, meaning investors were at that time willing to pay just as much for a dollar of stock income as for a dollar of bond income. And in recent years, investors have come to think so highly of equities, that they are now (March 1987) willing to pay three times as much for a dollar of stock income as they are for a dollar of bond income. The main points you should extract from this and the following posts on

Graham's discussion of growth stock investing are his thinking process. Graham was adaptable. Ironically, Graham was known for his net/net investing but he made most of his money owning GEICO.

We should be suspicious of short term data when formulating a hypothesis.

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Newer Methods for Valuing Growth Stocks (Chapter 39 of *Security Analysis, 4th Ed.)*

Historical Introduction

We have previously defined a **growth stock** as one which has increased its per-share earnings for some time in the past at *faster* than the average rate and is expected to maintain this advantage for some time in the future. (For our own convenience we have defined a true growth stock as one which is expected to grow at the annual rate of at least 7.2%--which would double earnings in ten years, if maintained—but others may set the minimum rate lower.) A good past record and an unusually promising future have, of course, always been a major attraction to investors as well as speculators. In the stock markets prior to the 1920s, expected growth was subordinated in importance, as an *investment* factor, to financial strength and stability of dividends. In the late 1920s, growth possibilities became the leading consideration for common stock investors and speculators alike. These expectations were though to justify the extremely high multipliers reached for the most favored issues. However, no serious efforts were then made by financial analysts to work out mathematical valuations for growth stocks.

The basic question asked by any investor is, **what is the right price for a given stock?** At the turn of the century, this question was answered by traditionalists in a very straightforward fashion. **The price an investor was willing to pay for a stock reflected what he would receive from his investment—his share of the company's earnings in the form of dividends paid out to him from those earnings.** Dividends were all-important, and stock prices tended to fluctuate with the level of dividend payments.

The tool most commonly used today to value stocks, the price-earnings (PE) ratio, had its origins in this analysis, although in a way that would now be considered somewhat backward. At the turn of the century, appropriate P/E ratios for stocks were derived from dividends. For example, for most of the decade preceding 1901, the average dividend yield of industrial stocks traded on the NYSE varied between 5% and 6%. As a standard rule of thumb, it was assumed that a mature industrial company should pay out between 50% and 60% of its earnings in dividends. Thus, if a company's annual dividend was between 5% and 6% of its stock price, and was to represent between 50% and 60% of its earnings, the EPS must equal 10% of the stock price or a P/E ratio of 10 to 1. (Source: *Toward Rational Exuberance* by B. Mark Smith

The first detailed basis for such calculations appeared in 1931—after the crash—in S.E. Guild's book, *Stock Growth and Discount Tables*. This approach was developed into a full blown theory and technique in J.B. William's work, *The Theory of Investment Value*, published in 1938. The book presented in detail the basic thesis that a common stock is worth the sum of all its future dividends, each discounted to its

present value. Estimates of the rates for future growth must be used to develop the schedule of future dividends, and from them to calculate total recent value.

In 1938 National Investor's Corporation was the first mutual fund to dedicate itself formally to the policy of buying growth stocks, identifying them as those which had increased their earnings from the top of one business cycle to the next and which could be expected to continue to do so. During the next 15 years companies with good growth records won increasing popularity, **but little effort at precise valuations of growth stocks was made.**

At the end of 1954 the present approach to growth valuation was initiated in an article by Clendenin and Van Cleave, entitled "*Growth and Common Stock Values*."[2] This supplied basic tables for finding the present value of future dividends, on varying assumptions as to rate and duration of growth, and also as to the discount factor. Since 1954 there has been a great outpouring of articles in the financial press—chiefly in the *Financial Analysts Journal*—on the subject of the **mathematical valuation of growth stocks**. The articles cover technical methods and formulas, applications to the Dow-Jones Industrial Average and to numerous individual issues, and also some critical appraisals of growth-stock theory and of market performance of growth stocks.

In this chapter we propose: (1) to discuss in as elementary form as possible the mathematical theory of growth-stock valuation as now practiced; (2) to present a few illustrations of the application of this theory, selected from the copious literature on the subject; (3) to state our views on the dependability of this approach, and even to offer a very simple substitute for its usually complicated mathematics.

The "Permanent Growth-Rate" Method

An elementary-arithmetic formula for valuing future growth can easily be found if we assume that growth at a fixed rate will continue in the indefinite future. We need only subtract this fixed rate of growth from the investor's required annual return; the remainder will give us the capitalization rate for the current dividend.

This method can be illustrated by a valuation of the DJIA made in a fairly early article on the subject by a leading theoretician in the field.[3] This study assumed a permanent growth rate of 4 percent for the DJIA and an over-all investor's return (or discount rate") of 7 percent. On this basis the investor would require a current dividend yield of 3 percent, and this figure would determine the value of the DJIA. For assume that the dividend will increase each year by 4 percent, and hence that the market price will increase also by 4 percent. Then in any year the investor will have a 3 percent dividend return and a 4 percent market appreciation—both below the starting value—or a total of 7 percent compounded annually. The required dividend return can be converted into an equivalent multiplier of earnings by

[2] *Journal of Finance*, December 1954

[3] See N. Molodovsky, "An appraisal of the DJIA." Commercial and Financial Chronicle, Oct. 30, 1958

assuming a standard payout rate. In this article the payout was taken at about two-thirds; hence the multiplier of earnings becomes 2/3 of 33 or 22.[4]

It is important for the student to understand why this pleasingly simple method of valuing a common stock of group of stocks had to be replaced by more complicated methods, especially in the growth-stock field. It would work fairly plausibly for assumed growth rates up to say, 5 percent. The latter figure produces a required dividend return of only 2 percent, or a multiplier of 33 for current earnings, if payout is two thirds. But when the expected growth rate is set progressively higher, the resultant valuation of dividends or earnings increases very rapidly. A 6.5% growth rate produces a multiplier of 200 for the dividend, and a growth rate of 7 percent or more makes the issue worth infinity if it pays any dividend. In other words, on the basis of this theory and method, no price would be too much to pay for such common stock.[5]

A Different Method Needed.

Since an expected growth rate of 7 percent is almost the *minimum* required to qualify an issue as a true "growth stock" in the estimation of many security analysts**, it should be obvious that the above simplified method of valuation cannot be used in that area. If it were, every such growth stock would have infinite value.** Both mathematics and prudence require that the period of high growth rate be limited to a finite—actually a fairly short period of time. After that, the growth must be assumed either to stop entirely or to proceed at so modest a rate as to permit a fairly low multiplier of the later earnings.

The standard method now employed for the valuation of growth stocks follows this prescription. Typically it assumes growth at a relatively high rate—varying greatly between companies –for a period of ten years, more or less. The growth rate thereafter is taken so low that the earnings in the tenth of other "target" year may be valued by the simple method previously described. The target-year valuation is then discounted to present worth, as are the dividends to be received during the earlier period. The two components are then added to give the desired value.

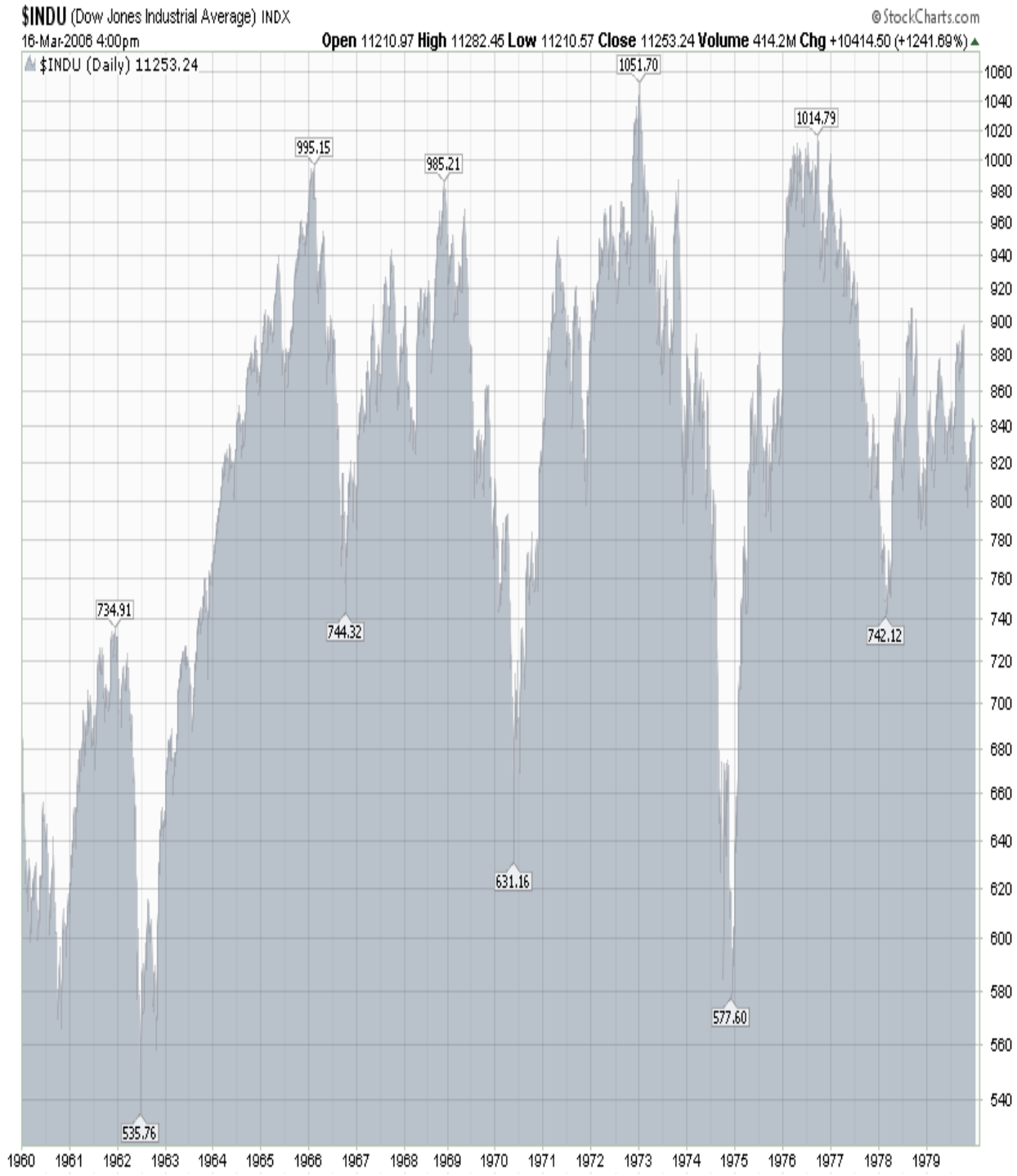
Application of this method may be illustrated in making the following rather representative assumptions: (1) a discount rate, or required annual return of 7.5%;[6] (2) an annual growth rate of about 7.2% for a ten-year period—i.e., a doubling of earnings and dividends in the decade; (3) a multiplier of 13.5% for the tenth year's earnings. (This multiplier corresponds to an expected growth rate after the tenth year of 2.5%, requiring a dividend return of 5 percent. It is adopted by Molodovsky as a "level of ignorance" with respect to later growth. We should prefer to call it a "level of conservatism." Our last

[4] Molodovsky here assumes a "long-term earning level" of only $25 for the unit in 1959, against the actual figure of $34. His multiplier of 22 produced a valuation of 550. Later he was to change his method in significant ways, which we discuss below.
[5] David Durand has commented on the parallel between this aspect of growth stock valuation and the famous mathematical anomaly known as the "Petersburg Paradox." See his article in Journal of Finance, September 1957 (in the appendix).
[6] Molodovsky's later adopted this rate in place of his earlier 7 percent, having found that 7.5% per year was the average over-all realization by common-stock owners between 1871 and 1959. It was made up of a 5 percent average dividend return and a compounded annual growth rate of about 2.5% percent in earnings, dividends, and market price.

assumption would be (4) an average payout of 60 percent. (This may well be high for a company with good growth.)

The valuation per dollar of present earnings, based on such assumptions, works out as follows:

A. Present value of tenth year's market price: The tenth year's earnings will be $2, their market price 27, and its present value 48 percent of 27, or about $13.
B. Present value of next ten years' dividends: These will begin at 60 cents, increase to $1.20, average about 90 cents, aggregate about $9, and be subject to a present-worth factor of some 70 percent –for an average waiting period of five years. The dividend component is thus worth presently about $6.30.
C. Total present value and multiplier: Components A and B add up to about $19.30, or a multiplier of 19.3 for the current earnings.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Valuation of DJIA in 1961 by this method.

In a 1961 article, Molodovsky selected *5* percent as the most plausible growth rate for DJIA in 1961-1970.[7] This would result in a ten-year increase of 63 percent, raise earnings from a 1960 "normal" of say, $35 to $57, and **produce a 1970 expected price of 765**, with a 1960 discounted value of 365. To this must be added 70 percent of the expected ten-year dividends aggregating about $300—or $210 net. The 1960 valuation of DJIA, calculated by this method, works-out to some $575. (Molodovsky advanced it to $**590** for 1961.)

Similarity with Calculation of Bond Yields

The student should recognize that the mathematical process employed above is identical with that used to determine the price of a bond corresponding to a given yield, and hence the yield indicated by a given price. The value, or proper price, of a bond is calculated by discounting each coupon payment and also the ultimate principal payment to their present worth, at a discount rate of required return equal to the designated yield. In growth-stock valuation the assumed market price in the target year corresponds to the repayment of the bond at par at maturity.

Mathematical Assumptions Made by Others

While the calculations used in the DJIA example may be viewed as fairly representative of the general method, a rather wide diversity must be noted in the specific assumptions, or "parameters," used by various writers. The original tables of Clendenin and Van Cleave carry the growth-period calculations out as far as 60 years. The periods actually assumed in calculations by financial writers have included 5 years (Bing). 10 years (Molodovsky and Buckley), 12 to 13 years (Bohmfalk), 20 years (Palmer and Burrell), and up to 30 years (Kennedy) . The discount rate has also varied widely – from 5 percent (Burrell) to 9 percent (Bohmfalk).[8]

The Selection of Future Growth Rates

Most growth-stock valuers will use a uniform period for projecting future growth and a uniform discount or required-return rate, regardless of what issues they are considering (Bohmfalk, exceptionally divides his growth stocks into **three quality classes**, and varies the growth period between 12 and 13 years, and the discount rate between 8 and 9 percent, according to class.) But the expected rate of growth will of course vary from company to company. It is equally true that the rate assumed for a given company will vary from analyst to analyst.

It would appear that the growth rate for any company could be established objectively if it were based entirely on past performance for an accepted period. But all financial writers insist, entirely properly, that **the past growth rate should be taken only as one factor in analyzing a company and**

[7] "Dow Jones Industrials: A Reappraisal," *Financial Analysts Journal*, March 1961

[8] See R. A. Bing, *"Can We Improve Methods of Appraising Growth Stocks?"* Commercial & Financial Chronicle, Sept. 13, 1956; *"The Growth Stock Philosophy,"* by J.F. Bohmfalk, Jr. Financial Analysts Journal, November 1960. J.G. Buckley, *"A Method of Evaluation Growth Stock,"* Financial Analysts Journal, March 1960; *"A Mathematical Approach to Growth-stock Valuation,"* by O.K. Burrell, Financial Analysts Journal, May 1960; R. E. Kennedy, Jr. , *"Growth Stocks: Opportunity or Illusion,"* Financial Analysts Journal, March 1960; G. H. Palmer, *"An approach to Stock Valuation,"* Financial Analysts Journal, May 1956; and the various articles by Molodovsky.

cannot be followed mechanically in setting the growth rate for the future. Perhaps we should point out, as a cautionary observation, that even the past rate of growth appears to be calculated in different ways by different analysts.[9]

Multiplier Applied to "Normal Earnings"

The methods discussed produce a multiplier for a dollar of present earnings. It is applied not necessarily to the actual current or recent earnings, but to a figure presumed to be "normal"—i.e., to the current earnings as they would appear on a smoothed-out earnings curve. Thus the DJIA multipliers in 1960 and 1961 were generally applied to "trend-line" earnings which exceeded the actual figures for those years—assumed to be "subnormal."

Dividends vs. Earnings in the Formulas. A Simplification

The "modern" methods of growth—stock valuations represent a considerable departure from the basic concept of J.B. Williams that the present value of a common stock is the sum of the present worth of all future dividends to be expected from it. True, there is now typically a ten-to-twenty – year dividend calculation, which forms part of the final value. But as the expected growth rate increased from company to company, the anticipated payout tends also to decrease, and the dividend component loses in importance against the target year's earnings.

Possible variations in the expected payout will not have a great effect on the final multiplier. Consequently the calculation process may be simplified by assuming a uniform payout for all companies of 60 percent in the next ten years. If T is the tenth-year figure attained by $1 of present earnings growing at any assumed rate, the value of the ten-year dividends works out at about 2.1 + 2.1 T. The present value of the tenth-year market price works out at 48 percent of 13.5T, or about 6.5T. Hence the total value of $1 of present earnings –or the final multiplier for the shares—would equal 8.6T + 2.1.

Table 39-1 gives the value of T and the consequent multipliers for various assumed growth rates.

Growth Rate	Tenth-year earnings (T)	Multiplier of present earnings (8.6T + 2.1)
2.5%	$1.28	13.1x
4.0	1.48	14.8x
5.0	1.63	16.1x
6.0	1.79	17.5x
7.2	2.00	19.3x
8.0	2.16	20.8x
10.0	2.59	24.4x
12.0	3.11	28.8x
14.3	4.00	36.5x
17.5	5.00	45.1x

[9] Note that the ten-year past growth rate of Dow Chemical was set at 16 percent by Kennedy, 10 percent by Bohmfalk, and 6.3 percent by Buckley, all writing in 1960. See previous footnote.

20.0	6.19	55.3x

These multipliers are a *little low* for the *small growth rates*, since they assume only a 60% payout. By this method the present value is calculated entirely from the current earnings and expected growth; the dividend disappears as a separately calculated factor. **This anomaly may be accepted the more readily as one accepts also the rapidly decreasing importance of dividend payments in the growth-stock field.**

An Apparent Paradox in Growth Stock Valuations

Let us return to the Molodovsky assumptions, used as our model and taken as representative. His method requires that all stocks be presumed to sell a decade hence at 13.5 times their earnings in that year. (Similarly Bohmfalk assumes that all the 100 growth stocks he valued in his article will sell at between 11 and 12.5 times their earnings 12 to 13 years hence.) It is obvious, however, that the 1971 multipliers will vary greatly as between different companies and that those which have had good actual growth during the 1960's will sell at much higher multipliers than those showing small improvement.

Why should not the valuers make the more realistic assumptions that their issues will sell in the large t year at a multiplier more or less proportionate to the assumed rate of growth? If a stock doubles its earnings in 10 years, and is presumed to be now worth 20 times its earnings, why should it not be expected to sell in 1971 as well at no less than 20 times its earnings? But if this assumption is made, the present value of the stock would have to be moved up to more than 20 times current earnings to avoid exceeding the 7.5% percent required return. This would then suggest a higher multiplier than 20 for the 1971 earnings, and the adjustments would have to be repeated until the present value approaches infinity.

The mathematical fact is that for any stock presumed to give a combined dividend return and growth exceeding the discount rate the assumed multiplier in the target year MUST be lower than the derived current multiplier. Otherwise we should be back to the infinite valuation which made us discard the simple assumption of a combined perpetual growth rate and dividend return exceeding 7 or 7.5%.

The objection to assuming a 13.5 multiplier ten years hence for earnings considered to grow at, say, a 10 percent rate in the decade can be overcome if the idea of **conservatism** and a **safety factor** are introduced into the discussion. A valuation of the Molodovsky type should be believed not as that present price which will in fact produce an annual return of 7.5% if the projected growth is realized, but rather as one which will produce a return *higher* than 7.5 under such conditions. **We consider it perfectly logical for the investor to require this mathematical result as compensation for the very large risk that the actual growth realized will prove less than the estimates.**

Note the danger of missed expectations with Chipolte (CMG). Growth prospects slowed.

Two Supplementary Calculations Recommended

To give this point a concrete expression for the investor, we suggest to analysts that their valuation of the kind we have been discussing be supplemented by either or both of two corollary calculations. The first would seek to approximate the true probable rate of return to the investor if the projected growth rate is realized. The simplest assumption for this purpose is that the shares will sell in 1971 at the same multiplier of their earnings as is applied by the valuer to the 1961 earnings. Since this will invariably exceed the 13.5 multiplier used in the first calculation, it will produce a rate of return above the basic 7.5%. The difference will indicate either (1) the extra profits that may be expected from realization of the growth prediction, or (2) the amount of the safety factor embedded in the primary valuation. The second such calculation could determine, by a similar method, how much below the estimate the actual growth rate may fall and still produce the required 7.5% percent return to the purchaser at the primary valuation.

Let us illustrate the derivation of these supplementary figures by using an issue with an expected 7.2 percent growth rate. Its current multiplier shown in Table 39.1, worked out at 19.3—based on a 60 percent payout and a 13.5 multiplier in 1971. Assume now that the actual multiplier in 1971 will be the 19.3 found proper for 1961. This will add $11.60 to the 1971 value of $1 of present earnings. By adroit manipulation of the compound interest tables we can establish that, on the new basis of 1971 value, the rate of return realized by the purchaser at 19.3 times 1961 earnings will be about 10 percent rather than the basic 7.5%. Similarly even if the actual growth rate averaged only 5 percent, but the multiplier was maintained at 19.3, the investor at this price would still obtain his target yield of 7.5%.

These calculations are by no means free of mathematical taint—partaking a bit of the bootstrap character--but they are not far off the mark, we think, in their implication that the original valuation formula includes a factor of safety of about one-third.

Uses of Growth Stock Valuations

Obviously, the most direct and positive use of a set of growth-stock valuations made by any of the methods proposed would be for the selection of attractive (undervalued) issues and the identification of overvalued ones. The two techniques discussed above--those of Molodovsky and Bohmfalk—were applied in this manner in the respective studies. The former found an "investment value" for each of the stocks in the DJIA and compared it with the concurrent price. The February 1961 level of the unit as a whole (649) was found to be 10 percent above its investment value of 590; five of the components were selling between 75 percent and 95 percent of value, fifteen between 100 and 120 percent, and ten between 120 and 153 percent. These valuations, and the resultant indications of current cheapness or dearness in the market, depended both on the specific formula approach used by Molodovsky and on his choice of estimated annual growth rates. The latter varied between a nominal 1.5% for United Aircraft to a maximum of 10 percent for Alcoa and Eastman Kodak.

Bohmfalk compares his valuations with current price in a different way. He calculates the growth rate implicit in the present price—i.e., that rate which, by his formulas would produce a value equal to the July 1960 price. This is done for 93 stocks classed into three quality groups. (He uses moderately different discount rates and growth periods for each group.) For the most part his projected growth rates are quite close to those implicit in the market price. (He takes 6.5% percent for the DJIA which he found to be both its historic rate for 13 years past and the market-price rate.) But in two cases his rate is nearly three times the market rate; in one case the market rate is 40% above his own.

It may be interesting to compare the future growth selected by Molodovsky and Bohmfalk for the nine stocks appearing in both lists. We add the "historic" or 1946-1959 rate as found by Bohmfalk.

Table 39-2 indicates that historical growth rates play an important, though by no means determinative, part in the projection of future growth, and also that quite considerable differences of opinion on the rates to take for a given document may develop between highly competent analysts.

Table 39-2 Comparative Historical and Projected Earnings Growth Rates of Nine Stocks

	Historic	Bohmfalk's Projections	Molodovsky's Projections
Allied Chemical	7.5%	10	6
Alcoa	12	13	10
Du Pont	10	10	7
Eastman Kodak	9.5	11.5	10
GE	9	10	10

Goodyear	12	9	5
International Paper	4.5	8.5	3.5
P&G	6	9	8
Union Carbide	9	9.5	5

Other Uses of the Valuation Approach

A number of studies of the subject have been devoted to the various interrelationships between value (as a multiplier of current earnings or dividend) rate of growth period of growth, and discount rate. If one starts with an actual or assumed dividend yield (or earnings multiplier) one can calculate alternatively (1) what rate of growth is necessary to produce a required overall return within a given number of years, (2) how many years' growth at various rates would be needed to produce the required return, and (3) what actual returns would follow from given rates of growth proceeding over given periods.[10] These presentations are undoubtedly of value to the analyst in making him aware of the quantitative implications as to growth rates and periods that must be read into the current market price for a growth stock.

Lessons from Past Experience

A study of actual investment results in groups of popular growth stocks will point up the need for substantial safety margin in calculating present values of such issues. **We know, of course, that where high growth rates have been continued over long periods, investors have fared very well in such shares, even though they paid what seemed to be a very high multiplier of current earnings at the time.** The outstanding example of such experience is IBM. Its apparent high selling prices in the past have always turned out to be low in the light of subsequent growth of earnings and subsequent price advances. The 1961 multiplier of, say, 80 times current earnings could also prove to be an undervaluation if the rate of past growth is maintained sufficiently long in the future. Investors generally have been encouraged by the brilliant performance of IBM to think that almost any company with a good record of recent growth and with supposedly excellent prospects for its continuance can be safely bought at a correspondingly high multiplier.[11]

When growth-stock experience is viewed as a whole and not simply in the blinding light of IBM achievements, quite a different picture emerges. One would have expected the general performance of growth stocks in the past two decades to have been decidedly superior to that of the market as a whole, if only because they have steadily increased in the market popularity, and thus have had an extra factor to aid their market prices. Available data would indicate that the facts

[10] An article by R. Ferguson in the May-June 1961 issue of Financial Analysts Journal, p.29, contains an ingenious "monograph," or arrangement of various figures in columns, which can be used for readily making a number of calculations of this type.

[11] **The difference between hindsight and foresight in growth-stock selection is well illustrated in this very instance of IBM.** The SEC study of investment companies (to be published 1962) shows that at the end of 1952 the 118 funds covered had only ½ of 1 percent of their common-stock holdings in IBM shares. This issue ranked twenty-third in a list of 30 largest holdings. These institutional investors were made cautious by the relatively high multiplier of IBM shares as far back as 1952. **They were unable to forecast with sufficient confidence its coming superior performance so as to impel them to make a concentrated investment in its shares.** While they participated to some degree in its later spectacular advance, this benefit was made relatively unimportant by the small size of their holdings.

are different from this plausible expectation. Let us refer to three studies or compilations on this point:

In an article on *"The Investment Performance of Selected Growth Stock Portfolios,"* by T.E. Adderley and D.A. Hayes (*Financial Analysts Journal, May 1957*), the authors trace through annually to the end of 1955 the results of investment in each of the five growth-stock portfolios recommended in articles published in a financial magazine in 1939, 1940, 1941, 1945, and 1946. For each portfolio and each year the results, including and excluding dividends, were compared with the corresponding results of the DJIA. In the aggregate, the performances ran surprisingly parallel. They may be summarized as follows:

Table 39-3 Overall Gains, Including Dividends Received		
Holding Period	**Recommended Portfolios**	**DJIA**
3 years	26%	22%
5 years	65%	60%
10 years	153%	165%

The average total gains for the varying periods (9 to 16 years) to the end of 1955 were **307** percent for the portfolios and **315** percent for the DJIA.

2. Bolmfalk's article gives an "Eleven-Year (1946-57) Record of Selected Growth Stocks," including 24 issues. Their annual results, compounded between 6 percent for Air Reduction and 25% for IBM. The author points out that the return averaged about **13** percent for the list—which compares with **13.4** percent shown in the same table for S&P's 425 industrials.

3. Wisenberger's Investment Companies 1961 has a separate analysis of the performance of "Growth Appreciation Funds." Results for 1951-1960 are available for 20 funds, on a basis assuming reinvestment of all distributions from security profits and other capital sources. The range of total gain for the 10 years is from 392 percent down to 127 percent, with a mean of 289 percent. The corresponding figure for S&P's 500 Stock Composite Average is 322 percent.[12]

Comment: **The results of these three studies point up the basic problems involved in attempting to select securities in the stock market primarily on the basis of the expected rate of future growth.** We do not know the extent to which mathematical valuation methods entered into the results we have compared with the market averages. It is possible, though by no means certain, that perfected techniques of the sort described earlier in this chapter may produce a better comparative performance in future years. However we must express an ingrained distrust on our part, of the

[12] No deduction from these performance results is made for sales load on mutual fund shares or commission cost on the S&P "portfolio." See also the third calculation in Appendix Note 10, p 741.

employment of refined mathematical calculations to arrive at valuations which at bottom are based on inherently inexact projections or "guesstimates" of performance for many years in the future.

Our Approach to Growth Stock Valuation

The authors of this book, separately and together, in working on this problem in recent years have developed several methods and formulas. Let us describe briefly three of these approaches. Somewhat to our surprise, the multipliers produced for given growth rates showed only narrow differences under the respective techniques.

Our first method endeavored to apply to growth stocks the same basic treatment that we have recommended for common stocks generally, **except that we eliminate the dividend factor in the valuation.** This means that the value would be found by applying a suitable multiplier to the average earnings for the next seven years. For any expected growth rate this average would be about equal to the middle or fourth year's earnings. (Note that this does not reduce our contemplated growth period below seven years: multiplier of the seventh-year figure.)

Our range of multipliers was established by two considerations. The first was a limitation of the seven-year growth rates to 20 percent per annum. This upper limit would envisage a 3.5 fold expansion of earnings in seven years—certainly enough for any investment expectations. Our second step was to establish s similar maximum multiplier of 20 times the average or fourth year's earnings. This maximum was arbitrarily taken as 150 percent of the 13 multiplier assigned to large and sound companies of medium prospects, such as the DJIA group in the aggregate, for which we project future growth at a 3.5% percent annual rate. These premises would suggest that the multipliers should advance proportionately from 13 to 20 as the expected growth rate rises from 3.5% to 20 percent. The resultant table would work out as follows:

Table 39-4

Expected Rate of Growth (for 7 years)	Multiplier of Average (fourth year earnings)	Multiplier of Current Earnings
3.5%	13x	15x
5.0	14x	17x
7.2	15x	20x
10.0	**16x**	**23.5x**
12.0	17x	27x
14.3	18x	31x
17	19x	35.5x
20	**20x**	41.5x

This schedule bears an accidental similarity to the Molodovsky technique, in that all the multipliers of the projected seventh-year earnings would fall within the narrow range of 11.5 to 12.5. However, the student should recall that Molodovsky's and most other methods discussed above involve a calculation of dividend income and a discount factor, neither of which we allow for here.

Our second approach was developed independently by Charles Tatham and was published by his firm in 1961.[13] It set forth in his book in his chapter on *"Valuation of Public Utility Common Stocks" (Chapter 43).*

Finally, our study of the various mathematical processes used by others led us to formulate two highly simplified methods of attaining approximately the same results as those produced by more complicated calculations. The first was our "8.6T plus 2.1" multiplier, developed directly out of the Molodovsky concept and previously discussed. The second is even simpler and reads as follows:

Value = current "normal" earnings x (8.5 plus 2G), where G is the average annual growth rate expected for the next 7 to 10 years.

The specific figures in this formula are derived largely from the concept that a multiplier of 8.5 is appropriate for a company with zero expected growth, and a current multiplier of 13.5 is satisfactory for one with an expected 2.5% percent growth. (The latter is a Molodovsky assumption.) In addition, the resulting multipliers for various other assumed rates appear to be as plausible as those worked out more laboriously by others.

A comparison of our four separate multipliers for various growth rates, together with the typical results of the Molodovsky method, is given (in Table 39-5 on the next page).

It will be noted that our preferred, based on a 7-year projection of growth, yields current multipliers quite close to those from the other formulas for growth rates up to 10 percent. For higher rates our recommended multipliers are more conservative than the others. This follows in part from the great impact of the eighth-to tenth-year growth at such optimistic rates, and in part from our self-imposed limitation of 20 times fourth-year earnings. Since we have already expressed our lack of confidence in predictions of large percentage gains for many years in the future, we do not have to say more to defend our conservatism in this range.[14]

[13] *Price-Earnings Ratios and Earnings Growth*, Bache & Company, NY, Oct. 2, 1961

[14] The case for not paying extremely high multiples is most persuasive. In this regard, the student should read S.F. Nicholson, *"Price-Earnings Ratios,"* Financial Analysts Journal, July-August 1960, pp.43-45. In a study of 100 common stocks, principally industrial issues of investment quality, including many of the largest companies over 11 selected time spans from 1939 to 1959, **the author found that the stocks selling at the lowest multiples showed much more appreciation than the stocks selling at the highest multiples and that the individual issues which showed losses during these periods or which showed relatively little appreciation were predominately in the high-multiple groups.** A similar study of 29 chemical stocks produced comparable results. For example, "the 50 percent lowest price-earnings ratios averaged over 50 percent more appreciation than the 50 percent highest ratios." Among Nicholson's conclusions is the statement, **"Many investors have apparently underestimated the importance of reasonable price-earnings relationships."**

Table 39-5							
Expected Growth Rate	0%	2.5%	5%	7.2%	10%	14.3%	20%
Growth in 10 years		28.0%	63%	100.0%	159%	280.0%	519%
Multipliers by:							
Molodovsky's method*	11.5x	13.5x	16.1x	18.9x	23.0x	31.2x	46.9x
Tatham's table®			18		25		
"8.6T +2.1" formula	10.7	13.1	16.1	19.3	24.4	36.5	55.3
"8.5 +2G" formula	8.5	13.5	18.5	22.7	28.5	37.1	48.5
Our preferred method (7 year projection)	8.5	13.5	17	20	23.5	31	41.5

*Molodovsky's method bases these rates on the assumption that the projected 10-year growth rates are the same as the actual rates for the previous 5 years.