

A Method of Valuing Growth Stocks

By GEORGE MACKINTOSH

This study was undertaken to devise a method of checking the reasonableness of the apparently high price-earnings ratios of secular (long term) growth stocks. We might define a secular growth stock as one whose earnings will probably persist upward in relation to average corporate earnings over a period of years. Demonstrated past growth is usually helpful in furnishing candidates for study.

This discussion is not concerned with non-secular growth of per share earnings, which can occur by (1) an upswing of the business cycle, (2) a reduction in tax rates, (3) a lowering of interest charges or preferred stock dividend requirements, (4) a betterment of the profit margin by reason of greater internal efficiency, (5) purchase of another company on a favorable basis, (6) an individual company improving its competitive position, (7) a special development of limited duration such as war, (8) a lowering of charges for depreciation or maintenance and repairs, or (9) a non-recurring type gain such as profit from sale of securities. We have in mind long term growth prospects which promise to extend well beyond the foreseeable future, which have a solid footing and which are based on industry trends. Almost always these are based on aggressive research for the development of new products and the extension of demand for existing ones. The latter is usually accomplished by quality improvement, price reduction, or both. Excellent examples of secular growth companies are International Business Machines, Scott Paper, duPont, Dow, Monsanto, Union Carbide and Coca Cola.

Wide Variations in Price-Earnings Ratios

Investors are rightly bewildered by the varying price-earnings ratios of common stocks, particularly of the so-called secular growth stocks. Price earnings ratios at any given time will differ from stock to stock because of many reasons, including (1) conservatism or lack of it in making charges against profits for depreciation, maintenance, repairs, inventory reserves, etc., (2) different types of capital structures which afford varying

amounts of leverage to the common stock, (3) varying strength of working capital positions, (4) differing records of earning's stability, (5) proportion of earnings paid out in dividends, (6) yield afforded in relation to other stocks of similar quality, and (7) prospects for long term growth, stability or retrogression of earnings. The last of these is usually by far the most important because the price earnings ratio usually has as its largest component an estimate of the trend of earnings for some years ahead.

For our analysis the years 1926 and 1936 were chosen, because in both years national income was close to \$70 billion. Net profits of 888 industrial corporations were \$2.8 billion in 1926 and \$2.6 billion in 1936. In 1926 the federal tax rate was 13½%, in 1936 about 17½%. Both were periods of general market optimism. While earnings and dividends here examined are for 1926 and 1936, stock prices are as of August 1927 and February 1937 as in both these months the Dow-Jones Industrial Average made a high of 190 and enough time had elapsed to gauge the previous year's results.

Growth Stocks Lead Market Advance

Table I gives statistics on 11 growth stocks for 1926 and 1936. Per share earnings, dividends and stock prices for 1926 have been adjusted for subsequent stock splits and stock dividends to make them comparable to 1936. Average per share earnings of the group increased from \$4.20 in 1926 to \$6.65 in 1936, a gain of 58%, which is at a compound rate of 4.8% yearly. If 1936 earnings had only been equal to those of 1926 such a result would have been superior to the results achieved by 888 industrials. Many good quality stocks examined had sharp declines in per share earnings. For example, in the ten year period United Fruit profits fell from \$7.44 to \$4.88, May Department Stores from \$5.95 to \$4.12, and Texas Gulf Sulphur from \$3.69 to \$2.57. It may be noted from Table I that the average stock price increased from 62 to 148, a gain of 139%, or at the compound rate of 9.1% yearly, as against 4.8% for earnings. Accordingly the 11 stocks in 1936 sold at 22.4 times earnings against 14.6 times in 1926. This higher price-earnings ratio reflected mainly the better esteem in which the shares were held as a result of proven growth, and to a lesser extent to the lash of the 1936 undistributed profits tax, which forced the group to pay out 73% of earnings in the form of dividends versus 57% in 1926 (66% in 1935). Interest rates also played a minor role in the higher 1936 valuation as Baa bonds in February 1937 were yielding 4.5%, against 5.5% in August 1927.

TABLE I
STATISTICS ON GROWTH STOCKS

Company	Vol. Per. Sh.		†Annual Growth Rate of Earnings		‡Annual Growth Rate of Stk. Price		Price Earnings Ratio		Cash Dividends		Yield		% Div. of Earnings	
	1938	*1926	1937	*1927	1936	*1926	1936	1926	1936	*1926	1936	1926	1926	1926
Dow	4.77	1.36	13.4	127	†12	26.6	26.6	8.8	2.20	0.49	1.7	4.1	46	43
Coca Cola	4.66	2.06	8.5	141	30	16.7	30.2	14.6	4.00	0.88	2.8	2.9	86	43
Air Reduct	2.79	1.20	8.8	79	22	13.5	28.3	18.3	2.50	0.58	3.2	2.6	90	48
Intern. Bus. M.	10.22	5.00	7.4	182	73	9.6	17.8	14.6	7.50	2.29	4.1	3.1	73	46
du Pont	7.56	4.00	6.5	177	89	7.2	23.4	22.2	6.10	3.00	3.5	3.4	81	75
Penn. Salt	10.18	7.08	3.8	176	78	8.5	17.3	11.0	8.50	5.00	4.8	6.4	83	71
Hercules Powder	6.33	4.55	3.4	185	†48	13.7	29.2	10.5	5.25	3.00	2.8	6.3	83	66
Union Carbide	4.09	3.03	3.0	111	48	8.7	27.2	15.8	2.30	1.67	2.1	3.5	56	55
American Can	5.80	4.39	2.8	112	65	5.6	19.3	14.8	5.00	2.00	4.5	3.1	86	46
Allied Chem.	11.17	8.90	2.3	242	147	5.3	21.6	16.5	6.00	5.45	2.5	3.7	54	61
Sears Roebuck	5.60	4.63	2.0	91	66	3.4	16.3	14.2	3.75	2.00	4.1	3.3	67	43
11 company average	6.65	4.20	4.8	148	62	9.1	22.2	14.8	4.82	2.39	3.3	3.9	73	57

*Adjusted for subsequent stock splits and stock dividends, if any.

†Unlisted.

‡On compound basis as per annuity tables.

Behavior of certain stocks in the group calls for comment. Dow Chemical, whose earnings and stock price increased the most during the ten year period, would have been the most difficult to select in 1926, as the management was reticent about its business and earnings at that time and its shares were not listed. Being a relatively small company at that time, it was capable of a sensational growth which a large company could not have duplicated.

Air Reduction sold at 28.3 times its 1936 earnings against 18.3 times in 1926, reflecting the good rate of earning growth. This growth was accomplished by retaining a heavy portion of earnings in the business for expansion of facilities for industrial gases, and for acquisition of a carbonic gas and dry ice business. After 1936 Air Reduction slowed down its rate of expansion and paid out most of its earnings in dividends, since which time the price-earnings ratio has declined drastically.

Non-Growth Companies

Statistics on companies lacking earnings growth in the ten-year period are given in Table II. Before examining them several individual company comments are in order. Both Liggett & Myers and Reynolds earned more and paid much larger dividends in 1936 than 1926, but their stock prices were moderately lower due primarily to fears of increased competition from smaller cigarette makers.

Burroughs earned the same in 1936 and 1926, and paid twice as large a dividend in 1936. The 1936 price-earnings ratio of 25.9 times compared with 16.6 times in 1926. Subsequent events proved the 25.9 ration of 1936 much too high.

American Snuff is an enigma. Its earnings and dividends were almost the same in both years but its stock sold at 65 in February 1937, as against 34 in August 1927. In both periods the earnings outlook was for little change.

General Electric sold at 65 or some 42.7 times its 1936 earnings in February 1937, an exceptionally high ratio even granting that reported profits are on the understated side. Here was a ratio much higher than for the growth stocks, and for a company paying dividends in excess of earnings at that time.

Kresge is a fine illustration of the pitfall awaiting the investor who pays a high price-earnings ratio for past and anticipated future growth and does not obtain it. Kresge's profits per share were about the same in 1936 and 1926 (\$1.99 vs. \$2.22), and 1936 dividends were double 1926 but the price-earnings ratio fell from 21.2 times in 1926 to 14.6 times in 1936.

TABLE II
STATISTICS ON NON-GROWTH STOCKS

Company	Net Per. Share	Stock Price		Price Earnings Ratio		Cash Dividends		Yield		% Div. of Earnings	
	1936 *1926	Feb. 1937	Aug. *1927	1936	1926	1936	*1926	1936	1926	1936	1926
Liggett & Myers.....	7.25	114	121	15.7	19.7	5.00	3.64	4.4	3.0	69	59
Reynolds, R. J.	2.92	57	58	19.5	22.1	3.00	1.52	5.3	2.6	103	58
Burroughs Add.	1.39	36	22	25.9	16.6	1.20	0.58	3.3	2.6	86	44
American Snuff	3.32	65	34	19.6	10.2	3.25	3.00	5.0	8.8	98	90
General Electric	1.52	65	36	42.7	23.4	1.70	0.63	2.6	1.8	113	41
Corn Products	3.86	71	56	18.4	14.2	3.75	2.25	5.3	4.0	97	56
Kresge	1.99	29	47	14.6	21.2	1.55	0.80	5.4	1.7	78	36
Tincken Roller	3.84	79	81	20.5	19.7	3.75	2.25	4.8	2.8	98	55
Wrigley	4.28	73	61	17.0	12.7	4.00	3.33	5.5	5.5	92	69
Eastman Kodak	8.23	175	174	21.2	18.3	6.75	8.00	3.9	4.6	82	84
10 company average ..	3.86	76	69	19.7	17.4	3.40	2.60	4.5	3.8	88	65

*Adjusted for subsequent stock splits and stock dividends, if any.

The earnings growth had been slowed down or eliminated in the interim by political, competitive and other factors

Turning now to statistics for non-growth stocks, in Table II we see that average per share earnings of \$3 97 in 1926 fell to \$3 86 in 1936 while average growth company profits gained from \$4 20 to \$6 65 The average market price for non-growth stocks increased from 69 to 76 or 10% between 1926 and 1936, while the average price for growth stocks gained 139%. Moreover, there would have been a decline in non-growth stock prices except for seemingly unjustified large gains by American Snuff, General Electric and Burroughs

The particular statistics given have shown the clear superiority of our growth stocks over non-growth We recognize that these selections have been made by hindsight and thus presupposed a perfect segregation of stocks between the two groups in 1926 Perfection in such a task could not be expected, but a keen security analyst should have had a fair degree of success.

TABLE III
PRICE-EARNINGS RATIOS FOR PERIOD OF OPTIMISM

% Div of Earnings	Annual Secular Growth Rate—%										
	0	1	2	3	4	5	6	7	8	9	10
100	16	17	18	—	—	—	—	—	—	—	—
90	16	17	18	18	20	20	—	—	—	—	—
80	15	16	17	18	20	20	22	23	25	28	30
70	14	15	16	18	20	20	21	23	25	28	30
60	—	—	15	17	18	19	20	22	24	25	26
50	—	—	—	—	—	17	18	19	21	22	23
40	—	—	—	—	—	—	—	—	18	19	20

Note—No ratios are supplied for low growth rate companies not retaining a high portion of earnings or for high growth rate companies not paying out substantially all their earnings

Study of the foregoing statistics has led to the preparation of Table III, which attempts to show a reasonable valuation for secular growth earnings in an environment of good business conditions and stock market prices such as in 1926-1927 and 1936-1937 Assuming certain annual growth rates and varying proportions of earnings paid out in dividends, the table gives what may be considered as reasonable price-earnings ratios Growth beyond 10% yearly tends to be unreal and may be capitalized at a low rate For instance no industry can match the persistent growth of the rayon business In the past twenty years demand increased from 33 million pounds in 1923 to 656

million pounds in 1943, which was equivalent to 16% yearly on a compound basis; 21% in the first ten years and 12% in the second. Yet rayon company stocks do not sell at high price-earnings ratios. This condition reflects a combination of factors such as (1) failure of earnings to keep pace, since growth was accomplished mainly by price reductions from \$2.75 per pound in early 1923 to 55c in 1943; (2) reluctance of investors to regard the growth rate highly, since its rabbit-like pace cannot be long continued; (3) industries in such a youthful stage are usually subject to a high rate of company casualties; and (4) such rapid expansion is generally accompanied by frequent new financing. But when the rayon industry's growth rate attains more realistic proportions and indications point to maintenance of this trend well into the future, its stocks may sell at higher ratios to earnings.

Table III shows the effects of dividend stringency on price-earnings ratios especially in the case of high growth rates where the ratios decline sharply with meagre dividends.

Applying Annual Growth Rates

For those interested in the outcome over a period of years of applying the annual growth rates in Table III, the following compilation has been made. At the end of five and ten-year periods, assuming growth at varying rates from 1% to 10% (compounded annually) earnings would be higher by the following percentages:

Annual Growth Rate %	Gain in 5 Years %	Gain in 10 Years %
1.....	5	11
2.....	10	22
3.....	16	34
4.....	22	48
5.....	28	63
6.....	34	79
7.....	40	97
8.....	47	116
9.....	54	137
10.....	61	159

To illustrate the manner in which Table III may be used, the stocks of International Business Machines and Allied Chemical are selected. Suppose that the security analyst in February 1937 was bearish and had to sell one of these stocks from a portfolio. Using figures in Table I, it may be seen that I.B.M. earnings had grown at the rate of 7.4% annually and 73% of

earnings were being paid out in cash dividends. After careful study it might have been possible to decide that future growth would probably continue at about this rate. Under such conditions the table above would indicate a price-earnings ratio of about 25 times, or much above the prevailing ratio of 17.8 times. Giving effect to stock dividends, I.B.M. stock has done much better than the general market since February, 1937, despite impairment of its foreign operations by the war and the halting of secular earnings growth by excess profits taxes.

From Table I it may be seen that in 1936 Allied Chemical's earnings had grown at the rate of 2.3% annually and that 54% of earnings were being paid in dividends. Moreover this growth was not of the secular type as it has been achieved in large part through using treasury funds to purchase common stock and retire preferred. But even admitting a 2% secular growth trend for the future, Allied stock, according to the table, should be selling at 15 times earnings instead of the actual 21.6 times. Allied stock has done much poorer than the general market since February 1937.

To demonstrate the reasonableness of the table's contents, several examples are cited. From the column on the left it may be seen that a non-growth stock paying out 100% of its earnings sells for 16 times profits. Under such conditions a yield of 6.2% is returned, or a fairly generous return in relation to a yield of 4% to 5% on Baa bonds. But this higher return is offset to some extent in the possible deterioration of earnings by reason of a full payout.

Going now to the extreme right column, a stock with a yearly growth rate of 10% annually and paying out 70% of earnings should sell at 30 times. Price appreciation at the end of 5 years at a 10% compound rate would be 61%, and would reduce the price-earnings ratio to 18.7 times on the basis of the original price.

Again in the far right column, a stock with a yearly growth rate of 10% and paying only 40% out in dividends would be selling at 20 times earnings. This seemingly low ratio is due to the stock price being held back by the small dividend, as even at 20 times the yield is only 2%. By the end of five years this stock would be selling at 12.4 times the original price.

The price-earnings ratio table is not only useful in appraising stock prices in a period of favorable stock market conditions, but is helpful now to one who has estimated future earnings of companies in such a postwar environment. It is thus possible to translate such estimated earnings into stock prices if the

analyst also estimates the outlook for earning's growth at that time. In fact, this study was undertaken as an adjunct to a much larger study on estimated postwar earnings of growth common stocks and prospective future growth trends of individual companies. Intimate knowledge of the subject company, its industry, and of course the forces behind future growth, are vital prerequisites. To estimate the future growth rate of Union Carbide, for example, each of its five divisions (ferroalloys, industrial gases, carbon products, chemicals and plastics) is studied from the angle of product trends into the future, and a growth rating of a certain percent per annum is assigned. The composite growth rate is then computed by weighting the growth rates of the subdivisions according to their proportionate contributions to earnings. This composite growth rating is then checked with past growth performance of dollar sales, unit sales, operating profit and net income, the excess of plant additions over depreciation charges in recent years, the excess of plant additions over retirements, ratio of research expenses to sales and to operating income, working capital gains and debt reduction, maintenance of profit margins, ratio of earnings to net worth, and proportion of earnings retained in the business. It is necessary to check periodically on growth by these mechanical means in order to determine whether sufficient funds are being kept in the business to permit future growth, and to be sure that retained earnings are being profitably employed. Thus estimation of future growth trends depends in part on mechanical methods.

Certain companies have had solid growth during the war years which has not shown in net income because of the penalizing influence of excess profits taxes. This growth will be uncovered when the excess profits tax is removed. Profits of these particular companies will then be materially higher in relation to average corporate profits than at any time in the past. It is possible that worthwhile price appreciation may lie ahead for secular growth stocks, especially since the apparent lack of growth in earnings during the war period has put many such issues in public disfavor.

Stocks with good longer-term growth prospects warrant careful consideration by all investors but have particular appeal to those in the higher tax brackets. Such investors will gain more by price appreciation than they will lose from withheld dividends and they will pay only a 25% tax on capital gains, when realized, against much higher rates on the dividends they might have received.