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Disaggregating Stock Data and Inferences There From

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Abstract

Published stock data can be disaggregated into its components. These include achieved rate of return, discount rate, and book value.

Key words: Stock, equity, valuation, book value, Gordon growth model, discounted cash flow model, growth rate, payout ratio, and retention rate.

A listing for common stocks and information available may contain the following:

Stock	Dividend	Yield	PE	Price	Growth
ABC	2.00	4.0	10	50.00	3%
LMU	4.00	5.0	5	80.00	2
XYZ	.10	1.0	20	10.00	6

In a previous analysis, I noted how one can infer unstated data from such a listing (see Higgins [2015]). In terms of notation let D be dividends, yield as dividends/price or D/P, PE as price/earnings or P/E where P is price, E is earnings, and g is growth. The yield can be confirmed from the data extant. Earnings E can be obtained from P/PE. Dividends come from E*(1-b) by definition where 1-b is the payout ratio D/E and equals yield times PE or D/P * P/E. By convention, it is the remainder of 1 – b where b is the retention rate of earnings for reinvestment and likewise is calculated from the remainder of 1 –D/P * P/E. The growth rate g for many firms equals b*r where r is the firm's achieved rate of return. Note that g is likely the same for P, E, and D—thus one can infer r from g/b. A firm's earnings is E = A*r where A is assets so one can determine it from E/r. Given the valuation model for common stock as D/(k-g) = E(1-b)/(k-g) = Ar(1-b)/(k-br) one can deduce the following about the available stock data from above:

	E	1-b	b	r	A
Stock	Earnings	Payout	Retain	Return	Assets
ABC	5.00	40%	60%	5.0%	$100
LMU	16.00	25	75	2.67	600
XYZ	.50	20	80	7.5	6.67

Because the valuation model can be solved for k = D/P +g which equals yield plus growth, the inferred discount rate can be determined. Here that would be 7 percent for all three securities. Notice that the first two securities ABC and LMU are trading below asset valuations and that the third XYZ is above which is consistent with r is less than k for the first two securities and r greater than k for the third security. The usefulness of this analysis is clearly of benefit and allows a quick snapshot to determine over and under valued securities. Moreover, noting that optimal dividend and retention rate policy merits good management then for stocks trading below asset value should have a high dividend payout and low retention policy and vice versa. Here it seems XYZ has an appropriate low dividend payout policy of 20 percent and a retention rate of 80 percent.

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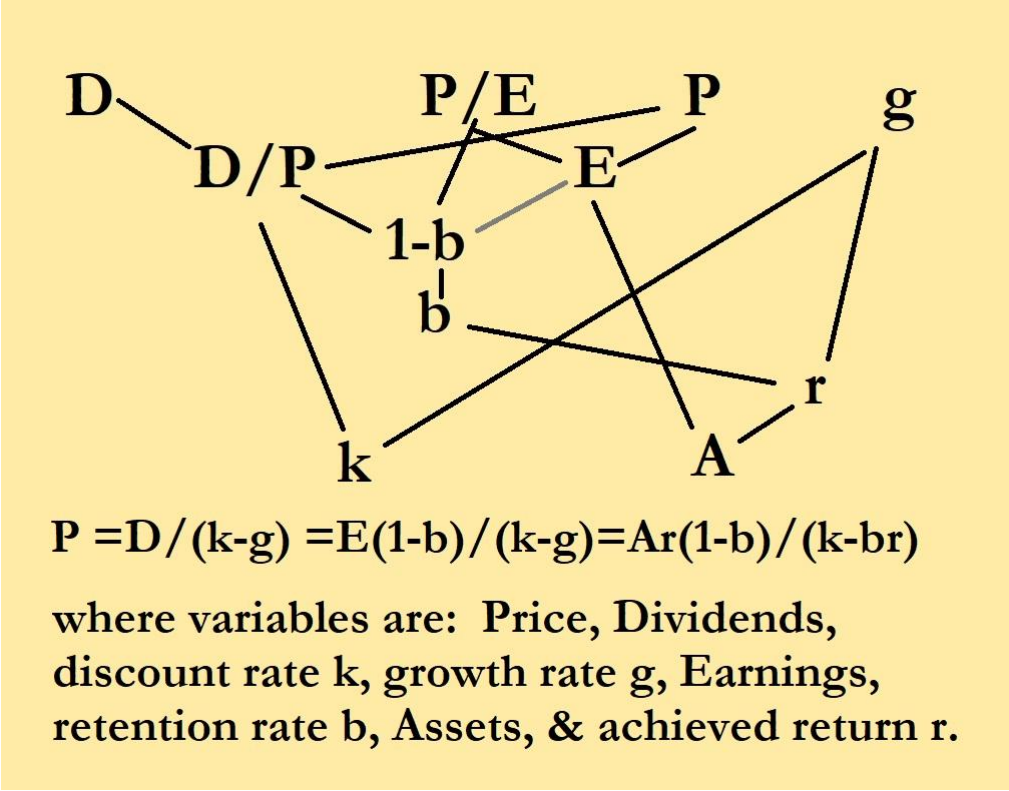
If ABC had an 80 percent payout ratio then its dividend would be $4.00, and thus have a retention rate of 20 percent and a growth rate of 1 percent and thus a price of 4/(.07 -.01) = $66.67 or an increase of 33.3 percent. If LMU had an 80 percent payout ratio then its dividend would be $12.80 and with a 20 percent retention rate have a growth rate of .533 percent and thus a price of 12.80/(.07-.00533) = $197.94 or an increase of 147.4 percent!

There have been cases where management wrongly thought that growth causes profitability instead of the other way around. Consider if XYZ changed its policy to an 80 percent payout ratio with now a dividend of $.40 and a retention policy of 20 percent and thus a growth rate of 1.5 percent. Its stock valuation would now be .4/(.07 -.015) = $7.27 or a decrease of -27.3 percent. Whether there is a prognosis for a management to change its policies is a matter ranging from conjecture to insights to public pronouncements.

Here's a summary and graphic of D/(k-g) = E(1-b)/(k-g) = Ar(1-b)/(k-br) or A = E/r = (P/PE)*(1-D/P*PE)/g = (P/PE -D)/g:

PE = P/E thus E = P/PE
D = E*(1 –b)
k = D/P +g
1 –b = D/E = D/P *PE
b = 1 –D/E = 1 –D/P *PE
g = b*r thus r = g/b
E = A*r thus A = E/r



Since yield and growth equals discount rate k = D/P +g from P=D/(k-g) and is confirmed as D/(D/P+g -g) equals P. Likewise P =Ar(1-b)/(k-g) gives A =P(k-g)/(r[1-b]) =Db/(g[D/P*PE]) =b/(g*PE/P]) =P/PE*(1 –D/P*PE)/g = (P/PE - D)/g. Confirmed from g = (A +A*b*r –A)/A = (E-D)/A. If k=r then g =1/PE-D/P.
Thus a shortcut to book value is earnings less dividends divided by growth rate.

Reference

Higgins, Charles [2015] "What's Wrong with PEG?" *Journal of Finance and Bank Management* Volume 3, Number 2, December 2015, pp. 1-6