Twitter Thread by Money Theory

Money Theory
@money_theory

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Get a cup of Bru coffee.

Today I will help you understand a simple implied growth calculator to find a stock buy level. Let's get started.

(A short thread)

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As you might know, The value of a stock is the present value of its lifetime cash flows.

For the long term buy and hold investor, the real cash flow from the stock is dividend income over its lifetime.

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In 1959, M J Gordon proposed a formula for this. The formula is

Value = D/(r-g)

Whereas

D = Expected dividends.
r = Required rate of return.
g = Dividend growth rate in perpetuity.

A detailed derivation of the formula is given at the end.

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Now, let's be honest, it is next to impossible to predict the growth rate in perpetuity for a firm.

So we twist the formula a little bit. Rather than finding out value, we find the *implied growth rate* This helps us to make deals with Mr. Market.

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Here is some math:

Value = D/(r-g)

r-g = D/value

D/value is nothing but dividend yield, so we substitute the same.

r-g = Dividend yield

g = r-Dividend yield

Implied growth = Required rate of return - Dividend yield

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Since we got implied growth formula, we can use it in some real-life firms.

Let's take Hind Unilever as a case study. The stock is trading at 83 x of FY 20 earnings. A traditional PE investor right away calls it overvalued.

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However, taking an r of 10% and a dividend yield of around 1%, the implied growth comes at 9% in perpetuity.

You have to make a bet here. If you think that the firm dividends grow at that rate forever, you buy or else you avoid.

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Let's take another example ITC Ltd. Assuming an r of 10% and a dividend yield of 5%, the implied growth comes at 5%.

Whereas the long-term dividend growth rate for ITC Ltd is 13%. So it looks like the stock is undervalued for some reason.

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Also, not all firms pay dividends. So you can use free cash flow in place of dividends.

And take an average number to reduce outlier risk.

Do note that r is not some magical number. So feel free to use your own required rate of return.

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Here is the maths behind the Gordon growth model.

Thank you for reading. Enjoy your weekend.

The End.

$$P = \frac{D}{(k-g)}$$

The classical Dividend Discount Model (DDM, or Gordon Growth Model, propagated by M J Gordon in 1959) is rooted in fundamental mathematics, viz, sum of an infinite geometric progression. For the academically and mathematically inclined, we discuss this derivation below.

Given -

D_o = Last declared dividend per share of a company in unit currency, say, INR

g = Annual growth rate of dividend to perpetuity

k = Required rate of return (technically also called Cost of equity)

where $g < k$

Given the above, the stockholder's dividend income in Year 1 will be $D_o \times (1+g)$.

In Year 2, it will be $D_o \times (1+g) \times (1+g)$ i.e. $D_o \times (1+g)^2$. In Year 3, it will be $D_o \times (1+g)^3$ and so on.

Next, every year's dividend needs to be discounted to the present value (PV). Thus, the mathematical term for PV of Year 1 dividend is

$D_o \times \frac{(1+g)}{(1+k)}$ Likewise, the PV of Year 2 dividend is given by

$D_o \times \frac{(1+g)^2}{(1+k)^2}$ and for Year 3, it will be $D_o \times \frac{(1+g)^3}{(1+k)^3}$ and so on.

Now, the DDM presumes that a stock is held on forever. Thus, the PV of future dividend flows (i.e. fair stock price) is given by the equation -

$$PV \text{ (or } P) = D_o \times \frac{(1+g)}{(1+k)} + D_o \times \frac{(1+g)^2}{(1+k)^2} + D_o \times \frac{(1+g)^3}{(1+k)^3} + \dots \text{ so on to infinity.}$$

This is the sum of a geometric progression which solves to

$\frac{a}{(1-r)}$, where a is the first term, and r is the ratio.

In this case,

$a = D_o \times \frac{(1+g)}{(1+k)}$ and $r = \frac{(1+g)}{(1+k)}$ Thus, the sum of the above series is -

$P = D_o \times \frac{(1+g) / (1+k)}{[1-(1+g) / (1+k)]}$, which when solved works out to $P = D_o \times \frac{(1+g)}{(k-g)}$

$D_o \times (1+g)$ is nothing but dividend of Year 1 or D_1. Thus, $P = \frac{D_1}{(k-g)}$

For ease of use, D is used instead of D_1 (next year's dividend) to arrive at the DDM formula.