Study exercises
Valuation of Common Stocks

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The Discounted Dividend Model (DDM)

Basic exercises (1-4):

The DDM model assumes that the value of a share of stock equals the present value of its expected future cash receipts.

The elements of the computation are:

Dividend one year hence:	$D_{(1)}$	$= €3$
Stock price one year hence:	$P_{(1)}$	$= €24$
Annual risk adjusted discount rate:[1]	k	$= 12.5\%$
Current stock price:	$P_{(0)}$	$= ???$

$$P_{(0)} = D_{(1)} / k$$

1. Solve $P_{(0)}$ from the data above.

$$P_{(0)} = D_{(1)} /(k - g)$$

2. Solve the case above with a growth rate of dividends (g) of 4.5%

Application of this growth model implies that:
-   $g < k$ for computational reasons
-   the annual appreciation rate of share value equals the growth rate of dividends, so: $P_{(1)} = P_{(0)} * (1 + g)$ and

$$P_{(n)} = P_{(0)} * (1 + g)^n$$

3. Compute the expected share price in the example above after 7 years.

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[1] or market capitalization rate or required rate of return.

As a consequence, the annual return is the summation of the <u>dividend yield</u> and the <u>capital gain</u> being equal to the required rate of return:

$$k_{(t)} = D_{(t)} / P_{(t-1)} + [P_{(t)} - P_{(t-1)}] / P_{(t-1)}$$

4.   Solve from this equation the dividend yield and the capital gains rate after year 7.

The future earnings and investment approach

Advanced exercises (5-6):

The basic approach concerning future earnings and investment is the computation of: PV of current earnings as a perpetual + NPV of future investment opportunities, or:

$$P_{(0)} = E_{(1)} / k + NPV \, INV$$

5.   Stable Ltd., all equity financed, expects this year's earnings to be €3 per share paid out at the end of the year. Future net investments are zero. The required rate of return for Stable is 10% annually.

   a.   Compute the current value of Stable, assume the date is January 1 in the current year.

   Gro Ltd., also all equity financed, expects earnings per share of €3 at the end of the current year as well. But its (fixed) plowback ratio of earnings for new investments is 60%. Required return on equity is 10% per year. The expected return on equity is 15% per year.

   b.   What is the expected growth rate of earnings?

   c.   When applying the DDM, what is the current share value of Gro assuming a capitalization rate of 10% per year? Assume the date is January 1 in the current year.

   d.   Could you split up the value of Gro into the value of current earnings and the NPV of future investments?

   e.   Now assume that the return on equity of Gro is 10% instead of 15%. Reconsider your answers b, c and d.

   f.   Draw a general conclusion from your findings in question e.

6.   Briefly discuss the following statement: "it is healthy for a firm to grow, so do it."

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