

Ralph's R&D Analyst

Ralph is a financial analyst who is charged with valuing a start-up firm, R&D Company. During R&D Company's first year of operations following its initial public offering (in which \$20 of equity capital was raised), earnings (x_t) were reported to be \$2. No dividends were paid during the first period and none are expected in the foreseeable future (i.e., until a liquidating dividend is paid).

Ralph believes that the population is equally divided into two types of such start-up firms: Type A (firms with favorable prospects), and Type B (firms with poor prospects). Further, Ralph believes that the first period's earnings report for R&D Company conditional on firm type and reporting method are as follows. Ralph expects a Type A R&D Company to report first period's earnings of \$5 conditional on optimistic reporting methods, or \$2 conditional on conservative reporting methods. Alternatively, Ralph expects a Type B R&D Company to report first period's earnings of \$3 conditional on optimistic reporting methods, or \$2 conditional on conservative reporting methods. However, Ralph knows that manager's reporting discretion for such start-up firms is limited since generally accepted accounting practices (GAAP) require conservative reporting methods and its management has difficulty credibly signalling the firm type without disclosing proprietary information which might compromise its competitive position.

Therefore, Ralph will have to conduct his own investigation through management interviews in combination with fundamental analysis. Ralph believes that such investigation will reveal what first period's earnings would have been conditional on optimistic reporting methods and the revision in future earnings based on other information not reflected in current earnings (v_t). Specifically, Ralph believes that next period's earnings adjusted for the opportunity cost of capital (namely, residual income or abnormal earnings) will be reduced by \$1.65 based on first period's other information ($v_1 = -\$1.65$) conditional on optimistic reporting for either firm type and reduced by \$1.10 based on first period's other information ($v_1 = -\$1.10$) conditional on conservative reporting and a Type B R&D Company. Any residual income reported in period one are expected to persist (but at a declining rate) for approximately five years and the impact

of other information is expected to carry forward at a rate of 55% ($g = .55$, defined below) of the previous year's level.

The above information is summarized in the following table. Assume that investors share Ralph's beliefs.

| <u>Firm Type (j)</u> | <u>Reporting Method</u> | \underline{x}_1^j | \underline{v}_1^j |
|----------------------|-------------------------|---------------------|---------------------|
| A | Optimistic | \$5 | \$(1.10) |
| | Conservative | \$2 | \$0.55 |
| B | Optimistic | \$3 | \$(1.10) |
| | Conservative | \$2 | \$(0.55) |

Ralph believes the following dynamics regarding residual income, other information and stock price are descriptive for R&D Company.

$$E[x_{t+1}^a] = w x_t^a + v_t \quad (1)$$

$$E[v_{t+1}] = g v_t \quad (2)$$

and
$$P_t = w/(R-w) x_t^a + R/[(R-w)(R-g)] v_t + y_t \quad (3)$$

where $R/[(R-w)(R-g)] > 0$ and $w/(R-w) > 0$, and w and g both equal 0.55 and are regarded as persistence parameters on residual income x_t^a (where $x_t^a = x_t - (R-1)y_{t-1}$ and y_t = firm's book value at time t) and other information v_t , and $R =$ one plus the discount rate = 1.10.

Required:

1. Identify the valuation coefficient on
 - a. residual income, x_t^a , in equation (3).
 - b. other information, v_t , in equation (3).
2. Verify that $P_1(x_t^A = \$2) = \24 and $P_1(x_t^B = \$2) = \20 , and determine the pooled price R&D Company (P_1) at time one assuming that firm type is unknown.
3. Assuming that R&D Company is a Type B firm,
 - a. determine period two's expected earnings ($E_1[x_2^B]$).
 - b. and, assuming that $E_1[x_2^B] = \$1.65$, determine period three's expected earnings ($E_1[x_3^B]$).
4. Assuming that R&D Company is a Type A firm,
 - a. determine period two's expected earnings ($E_1[x_2^A]$).
 - b. and, assuming that $E_1[x_2^A] = \$2.75$, determine period three's expected earnings ($E_1[x_3^A]$).
5. Assuming that R&D Company's management is free to report either optimistically or conservatively,

- a. determine R&D's stock price at time one if the first period's earnings report (x_1) is \$5.
 - b. determine R&D's stock price at time one if the first period's earnings report (x_1) is \$3.
6. Should R&D Company's reporting be regulated so that management's choice is limited to conservative accounting methods? Why?
 7. If limiting manager's discretion enhances financial reporting credibility but limits its information content, what informational role do analysts (and other informational intermediaries between managers and other firm stakeholders, such as auditors) play?