

## Earnings Response Coefficients

Characteristics of firms and unexpected earnings may affect the magnitude of abnormal share return.

**Earnings response coefficient [ERC]** measures the extent of a security's abnormal market return in response to the unexpected component of reported earnings of the firm issuing that security.

How to calculate ERC: Divide abnormal share return by unexpected earnings for the period, resulting in the abnormal return per dollar of abnormal earnings.

Factors affecting ERC:

### 1. Firm Characteristics

- **Risk (beta): Higher CAPM beta – Lower ERC**
  - The riskier the sequence of a firm's future expected returns is, the lower its value will be to a risk-averse investor, other things equal.
  - If a firm recently released a good news earnings information and issues a security that has a high beta, investors will be less likely to buy. Less demand implies a lower increase in market price and share return in response to good news, hence lower ERC (lower than it could've been, could've been higher)
- **Capital Structure: Higher debt – Lower ERC**
  - For highly levered firms, an increase in earnings adds strength and safety to bonds and other debts, so that good news in earnings goes to debtholders rather than shareholders. Therefore, the ERC for a high levered firm should be lower than that of a firm with little or no debt, other things equal.
- **Growth opportunities: Higher Growth – Higher ERC**
  - For example, the firm's good news is about success in the firm's recent investment. This earning will persist in the future and therefore will result in higher ERC. Also, this signals to the market that the firm can identify profitable investments and therefore labeled as a growth firm.

### 2. Earnings Characteristics

- **Earnings persistence: Higher persistence – Higher ERC**
  - For example, if the good news is about increase in operating efficiencies, ERC should be higher than if news is about unexpected gain on disposal of plant. This is because the current unexpected earnings from the increase in efficiency will persist into the future.
- **Accrual quality – Higher quality – Higher ERC**
  - **Net operating income = cash flow from operations + net operating accruals**
  - For example, if the allowance for DD is \$20 and AR is \$100 and at the end they collected \$80, that means they have a high accrual quality. But if they only collected \$70, that means earning quality is bad (manager may have reduced allowance for DD to increase current reported net income)
  - Discretionary accruals are where management uses his control over accruals to influence the amount of net income.

### Different components [drivers] of earnings can have different persistence:

- **Permanent – expected to persist indefinitely (ERC > 1)**
  - o e.g. changes in competition, new technology, successful patents, acquisitions, reorganizations, or economies of scale
- **Transitory – affecting earnings in current year only (ERC = 1)**
  - o e.g. disposals of capital assets
- **Price irrelevant – persistence of zero (ERC = 0)**
  - o e.g. accounting policy choices that have no cash flow effects: capitalizing R&D, staff training costs, or advertising costs

### Earnings persistence: P&L vs OCI

In general P&L (Historic cost) versus OCI (Fair value)

**Historic cost:** recognize transactions and earnings/good news that is expected to persist (think about accounting conservatism) (ERC > 1)

- Measurement under the historic cost accounting does not consider all future cash flows in regards to \$1 of earning. So, \$1 of unexpected earning in this period might produce another \$1 earning next period

**Fair value:** recognize the change in value of the assets and liabilities (ERC = 1)

- \$1 of earning will result in \$1 of abnormal market return. All expected future cash flows are already taken into account.
- So, fair value uses exit price (price at which buyer wants to buy PPE after calculating its future expected cash flows)
- Assuming markets are efficient and prices follow a random walk

How can earnings quality be measured in practice?

$$\Delta WC_t = b_0 + b_1CFO_{t-1} + b_2CFO_t + b_3CFO_{t+1} + e_t$$

- WC = Change in working capital (current assets – current liabilities)
- CFO = operating cash flow
- b = constants to be estimated
- e = residual error term – portion of total accruals not explained by cash from operations

**Quality is measured by e. The smaller the error term in this regression, the higher the firm's earnings quality.**

Implications of ERC Research

- Why are ERCs important?
  - o They tell us what things affect the *information content* of accounting earnings and how we should best design a financial report.
- Importance of full disclosure: Display all components of net income to enable permanent effects to be assessed.
- Make growth opportunities explicit
- Expand disclosure of the magnitude and nature of financial instruments (week 9) since the type and amount of debt has an impact on the market's response

Conclusions: (1) Efficient markets theory: shares prices reflect all publicly available information; expectations are built into price. (2) There is empirical evidence that earnings numbers are useful. (3) There is empirical evidence that the use of earnings number varies as a function of firm characteristics, earnings persistence and earnings quality.

## Lecture 5 (Accounting analysis)

**Accounting analysis** (often referred to as ‘earnings quality’ analysis) – Evaluate the degree to which a firm’s **accounting** captures its **fundamental value** and to undo any **accounting distortions**

Purpose:

- Evaluate the degree to which a firm’s accounting captures its **underlying business reality**
  - o identify areas of **accounting flexibility**
  - o evaluate **appropriateness** of accounting policies and estimates
  - o **‘undo’** any apparent distortions

**Valuation** – an important goal of many types of business analysis

- Purpose: Estimate fundamental (intrinsic) value of a company (or share)
- Basis: Present value theory (time value of money)
- Note: While the value of a firm is a function of its future cash flow performance, it is also possible to assess a firm’s value based on the firm’s current book value of equity, and its future return on equity (ROE) and growth.

### Financial reporting in capital markets

In a capitalist economy, matching savings to business investment opportunities is complicated, because [Dragons’ den example]:

1. Entrepreneurs typically have **better information** than savers on the value of business investment opportunities
2. Communication by entrepreneurs to investors is **not completely credible**
  - because investors know entrepreneurs have an incentive to inflate the value of their ideas
3. Investors lack the financial sophistication to differentiate among various business plans

### Accounting system features

**Accrual accounting:**

- Corporate financial reports use accrual rather than cash accounting
- The effects of economic transactions are recorded based on expected, not necessarily actual, cash receipts and payments.

Managers’ inside knowledge is a source of both **value** and **distortion** in accounting data. Business analysis attempts to reveal **managers’ inside information** from public financial statement data. Analysts use financial statement information to “get behind the numbers”. However, financial statements do not always provide a complete and faithful picture of a company’s activities and conditions.

Financial reporting information is noisy and biased

- even in the presence of accounting regulation and external auditing

If potential distortions are large, accounting analysis can add considerable value

- It is an important *precondition* for effective financial analysis
- The quality of financial analysis and the inferences drawn depend on the quality of the underlying accounting information, the raw material for analysis

## Valuation Formulas

### 1. Discounted dividends:

Value of equity = Present value (PV) of forecasted **future dividends**

$$Equity \text{ _ Value} = \frac{DIV_1}{(1+r_e)} + \frac{DIV_2}{(1+r_e)^2} + \frac{DIV_3}{(1+r_e)^3} + \dots$$

Assuming **constant** dividend growth rate ( $g_d$ ) indefinitely:

$$Equity \text{ _ Value} = \frac{DIV_1}{(r_e - g_d)}$$

### 2. Discounted cash flow:

Value of equity = Present value (PV) of multiple year forecasts of **free cash flows to equity claim holders**

$$Equity \text{ _ value} = \frac{NI_1 - \Delta BVA_1 + \Delta BVD_1}{(1+r_e)} + \frac{NI_2 - \Delta BVA_2 + \Delta BVD_2}{(1+r_e)^2} + \dots$$

NI = Net Income

$\Delta BVA$  = Change in book value of net assets

$\Delta BVND$  = Change in book value of net debt

FCF = Free Cash Flow to equity

Free cash flow (FCF) = Net Income -  $\Delta BVA$  +  $\Delta BVND$

### 3. Discounted abnormal earnings (residual income):

Value of equity = sum of **equity book value** and discounted forecasts of **abnormal earnings**

$$Equity \text{ _ value} = BVE_0 + \frac{NI_1 - r_e \times BVE_0}{(1+r_e)} + \frac{NI_2 - r_e \times BVE_1}{(1+r_e)^2} + \frac{NI_3 - r_e \times BVE_2}{(1+r_e)^3} + TV$$

$$TV = \frac{(1+g)^*(NI_3 - r_e \times BVE_2)}{(r_e - g)} \Big/ (1+r_e)^3$$