Ratio Analysis:
Liquidity, Activity & Coverage
Quality of Earnings

- Fraudulent actions
- Above-average financial risk
- One-time transactions
- Borrow from the future/reach into the past
- Ride the depreciation curve
  » Accumulated depreciation / depreciation expense
- Milk the business
  » Capital expenditures / adjusted depreciation.
Quality of Earnings...

- Top management
  » All “yes” people?
- Less-than-conservative accounting
  » Footnotes
  » Alternative accounting practices
  » Assets vs. expenses
  » Primary vs. secondary operations
  » Tax income vs. financial accounting income
  » Accounting income vs. inflation-adjusted income.
Ratio Categories

- Liquidity ratios
  » Current ratio, quick ratio, net working capital, defensive interval
- Activity ratios
  » Turnover ratios for various asset categories
- Coverage ratios
  » Debt ratios and interest coverage ratios
- Profitability ratios
  » ROA, ROE.
Standards of Comparison

- **Industry**
  - Often poorly defined
- **Different firms do their accounting differently**
  - Selection of accounting principles
  - Fiscal years, ...
- **Trend**
  - Measure current performance vs. past performance.
Liquidity Ratios

- **Purpose:**
  - Provide insight into the firm’s ability to meet short-term obligations

- “So-called” published standards exist for current and quick ratios
  - Standards are of questionable value.
Current Ratio

▪ Current ratio
  » Current assets / current liabilities
  » Window dressing is easy

▪ Example: The bank requires a 2:1 ratio
  » Current assets = $150; current liabilities = $100
  » How can management quickly fix the problem?

▪ Answer: ___________
Net Working Capital

- **Net working capital**
  - Current assets - current liabilities
  - Noncurrent liabilities + equity - noncurrent assets

- **Example:**

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$1,000</td>
<td>Current liabilities</td>
<td>$ 300</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>4,000</td>
<td>Long-term debt</td>
<td>2,700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Equity</td>
<td>2,000</td>
</tr>
</tbody>
</table>

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<tr>
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</tr>
<tr>
<td>Current liabilities</td>
<td>(300)</td>
<td>Equity</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed assets</td>
<td>(4,000)</td>
</tr>
</tbody>
</table>
Cash Conversion Cycle

- Represents a liquidity measure
- CCC’s Definition:
  - Number of days of negotiated financing needed to support the operating cycle
- Formula:
  \[ CCC = DSO \text{ inventory} + DSO \text{ receivables} - DSO \text{ spontaneous financing} \]
- Why not simply use the current ratio?
### An Example: Current Ratio vs. CCC

#### Abridged Balance Sheet

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accts. receivable</td>
<td>100</td>
<td>Accts. payable</td>
<td>50</td>
</tr>
<tr>
<td>Inventory</td>
<td>200</td>
<td>Accruals</td>
<td>75</td>
</tr>
<tr>
<td>Sales</td>
<td>300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*How much is the CR? How much is the CCC?*

Current ratio = \( \frac{(100 + 200)}{(50 + 75)} = 2.4 \)

CCC = \( 360 \times \left( \frac{200}{300} + \frac{100}{300} - \frac{125}{300} \right) \)

\[ = 240 + 120 - 150 = 210 \text{ days}. \]
Current Ratio vs. CCC
Continued...

Buy inputs at day = 0

DSO inventory

DSO payables

Pay spontaneous liabilities at day = 15

Sell product at day = 24

DSO receivables

Collect AR at day = 36

CCC period

CCC represents the number of days of financing needed to support the operating cycle.

CCC represents the number of days of financing needed to support the operating cycle.
## W.T. Grant’s Cash Conversion Cycle

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Receivables</td>
<td>116.5</td>
<td>118.8</td>
<td>125.0</td>
<td>120.4</td>
<td>109.4</td>
</tr>
<tr>
<td>Inventory</td>
<td>139.5</td>
<td>140.6</td>
<td>127.2</td>
<td>127.2</td>
<td>105.6</td>
</tr>
<tr>
<td>Operating cycle</td>
<td>256.0</td>
<td>259.4</td>
<td>252.2</td>
<td>247.6</td>
<td>215.0</td>
</tr>
<tr>
<td>Less payables</td>
<td>21.0</td>
<td>25.9</td>
<td>34.8</td>
<td>36.9</td>
<td>34.0</td>
</tr>
<tr>
<td>Cash conversion cycle</td>
<td>235.0</td>
<td>233.5</td>
<td>217.4</td>
<td>210.7</td>
<td>181.0</td>
</tr>
<tr>
<td>Current ratio w/ paper</td>
<td>1.98</td>
<td>1.95</td>
<td>2.29</td>
<td>1.97</td>
<td>2.19</td>
</tr>
<tr>
<td>Current ratio w/o paper</td>
<td>10.61</td>
<td>8.75</td>
<td>6.64</td>
<td>6.04</td>
<td>5.98</td>
</tr>
</tbody>
</table>
Defensive Interval

- Defensive interval
  - Formula: Quick assets / daily cash expenses
    » Quick assets = Cash + marketable securities + receivables
    » Daily cash expenses
      = (Cash sales - cash profits) / 365 days
      • Cash sales = Accrual sales + change in AR
      • Cash profits = CFFO on the cash flow statement.
Defensive Interval

Abridged Balance Sheet This Year

<p>| | | | |</p>
<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Accts. receivable</td>
<td>100</td>
<td>Accts. payable</td>
<td>50</td>
</tr>
<tr>
<td>Inventory</td>
<td>200</td>
<td>Accruals</td>
<td>75</td>
</tr>
</tbody>
</table>

Sales: 3000; CFFO: 10; Change AR = 25

How much is the CR? the defensive interval?

CR = (100 + 200) / (50 + 75) = 2.4

DI = 12.1 days
## Defensive Interval

<table>
<thead>
<tr>
<th>Description</th>
<th>This Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick assets</td>
<td>100</td>
</tr>
<tr>
<td>Accrual sales</td>
<td>3,000</td>
</tr>
<tr>
<td>Change in AR</td>
<td>(25)</td>
</tr>
<tr>
<td>Cash sales</td>
<td>2,975</td>
</tr>
<tr>
<td>CFFO</td>
<td>10</td>
</tr>
<tr>
<td>Cash expenses</td>
<td>2,965</td>
</tr>
<tr>
<td>Divide by 360 days</td>
<td></td>
</tr>
<tr>
<td>Daily cash expenses</td>
<td>8.236</td>
</tr>
<tr>
<td>DI</td>
<td>12.1</td>
</tr>
</tbody>
</table>

DI represents the number of days the firm can continue to operate by converting quick assets to cash without further sales.
## Liquidity Recap

<table>
<thead>
<tr>
<th></th>
<th>This Year</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current ratio</td>
<td>2.40</td>
<td>2.10</td>
</tr>
<tr>
<td>Quick ratio</td>
<td>0.80</td>
<td>0.70</td>
</tr>
<tr>
<td>CCC</td>
<td>21.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Def. Interval</td>
<td>12.1</td>
<td>16.0</td>
</tr>
</tbody>
</table>

Assume last year’s figures are correct.
Activity Ratios

- **Purpose:**
  - Measure efficiency in managing assets

- **Turnover ratios:**
  - Definition: Sales / asset

- **Assume:**
  - Total assets
    - Cash + receivables + inventory + fixed assets
    - $1,000 = $100 + $300 + $200 + $400 & sales = $5,000

- **Calculate turnover ratio for each component**

**Questions:**
- Are the ratios additive for the components?
- Interpretations?
Coverage Ratios

- **Purpose:**
  - Address the long-run solvency of the firm

- **Ratios:**
  - Debt / capital: definitional problems
  - Interest coverage: EBIT / interest
  - Fixed-charge coverage: (EBIT - fixed) / fixed charges
  - Degree of financial leverage: % Δ NI / % Δ EBIT
  - Book value per share: Equity value / # shares
  - Cash flow per share: (NI + deprec.) / # shares

- **Problem:** Accrual accounting vs. cash flows.
The End