Turnarounds

Financial Decline:
When Bad Things Happen to Good Companies
A Better Place
Financial Distress Risk

- View from an outsider’s perspective
  - investors
  - creditors
- Also useful for evaluating prospects of
  - customers
  - suppliers
- Useful platform for crafting and insider’s response
Focus of All Financial Analysis

- Profitability
  - past and current performance

- Risk
  - will the future results be like the past?
What Do Investors Worry About?

- **A decline in investment value**
  - systematic risk (beta)
    - impact of changes in macroeconomic circumstances
      - prices (inflation)
      - interest rates
      - economic growth (recession)
      - employment
    - how firm compares to market
      - principle components
        - variability of sales
        - operating leverage
        - financial leverage
  - nonsystematic risks
    - risk of casualty, government appropriation, customer bankruptcy
What Do Creditors Worry About?

- **Inability to collect (principal and/or interest)**
  - in concept quite similar to systematic risk
    » higher risk → higher interest rate
  - situation is different post-issue if debt is nonmarketable (e.g., bank loan)
    » fixed future returns
      - limited options for dealing with increasing risk
        - debt covenants
    » requires careful *ex ante* analysis
Basic DuPont Framework

Return on Equity
(Income/Equity)

Net Profit Margin
(Income/Sales) \times\ Asset Turnover
(Sales/Assets) \times\ Total Leverage
(Assets/Equity)

detailed margin analysis  
detailed turnover analysis  
detailed solvency and liquidity analysis
Getting Data
## Profitability

**KOHL’s**

<table>
<thead>
<tr>
<th>Fiscal Year End Date</th>
<th>Actual 2015</th>
<th>Actual 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Dupont Model</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Profit Margin</td>
<td>0.066</td>
<td>0.054</td>
</tr>
<tr>
<td><strong>x</strong> Total Asset Turnover</td>
<td>1.681</td>
<td>1.497</td>
</tr>
<tr>
<td><strong>x</strong> Total Leverage</td>
<td>1.675</td>
<td>1.705</td>
</tr>
<tr>
<td>= Return on Equity</td>
<td>0.185</td>
<td>0.138</td>
</tr>
</tbody>
</table>

### Turnover Analysis

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Operating Asset Turnover</td>
<td>2.096</td>
<td>1.550</td>
</tr>
<tr>
<td>Net Working Capital Turnover</td>
<td>2.380</td>
<td>1.741</td>
</tr>
<tr>
<td>Ave Days to Collect Receivables</td>
<td>46.306</td>
<td>69.025</td>
</tr>
<tr>
<td>Ave Inventory Holding Period</td>
<td>55.617</td>
<td>88.295</td>
</tr>
<tr>
<td>Ave Days to Pay Payables</td>
<td>23.043</td>
<td>41.458</td>
</tr>
<tr>
<td>PP&amp;E Turnover</td>
<td>1.735</td>
<td>1.267</td>
</tr>
</tbody>
</table>

### Analysis of Leverage

#### - Long-Term Capital Structure

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt to Equity Ratio</td>
<td>0.666</td>
<td>0.372</td>
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</table>

#### - Short-Term Liquidity

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
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<tbody>
<tr>
<td>Current Ratio</td>
<td>3.208</td>
<td>3.137</td>
</tr>
<tr>
<td>Quick Ratio</td>
<td>2.130</td>
<td>1.787</td>
</tr>
</tbody>
</table>
Short-Term Liquidity Risk

◆ Focus on current assets--source of near term cash
  – current position and trends
    » liquidity ratios
      ◆ quantity of current assets (in relation to liabilities)
    » turnover ratios
      ◆ quality of current assets
Short-Term Liquidity Risk

Current Ratio = \( \frac{\text{Total Current Assets}}{\text{Total Current Liabilities}} \)

Quick Ratio = \( \frac{\text{Cash} + \text{Marketable Securities} + \text{A/R}}{\text{Total Current Liabilities}} \)
## Current Ratio

KOHL's

### eVal

<table>
<thead>
<tr>
<th>Fiscal Year End Date</th>
<th>Actual</th>
<th>Actual</th>
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<tbody>
<tr>
<td>1/31/2015</td>
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<td></td>
</tr>
<tr>
<td>1/31/2016</td>
<td></td>
<td></td>
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</tbody>
</table>

#### Basic Dupont Model

- Net Profit Margin: 0.066, 0.054
- Total Asset Turnover: 1.681, 1.497
- Total Leverage: 1.675, 1.705
- Return on Equity: 0.185, 0.138

#### Turnover Analysis

- Net Operating Asset Turnover: 2.096, 1.550
- Net Working Capital Turnover: 2.380, 1.741
- Avg Days to Collect Receivables: 46.306, 69.025
- Avg Inventory Holding Period: 55.617, 88.295
- Avg Days to Pay Payables: 23.043, 41.458
- PP&E Turnover: 1.735, 1.267

#### Analysis of Leverage
- Long-Term Capital Structure: Debt to Equity Ratio: 0.666, 0.372

#### Analysis of Leverage
- Short-Term Liquidity: Current Ratio: 3.208, 3.137, Quick Ratio: 2.130, 1.787

### Benchmarks?
Why?

**IT revolution**
- enables more aggressive working capital management
  - just-in-time
## Industry Norms (by SIC Code)

<table>
<thead>
<tr>
<th>Current Ratio</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Major Airlines</td>
<td>0.6</td>
</tr>
<tr>
<td>– Integrated Oil and Gas</td>
<td>1.2</td>
</tr>
<tr>
<td>– Auto Parts</td>
<td>1.3</td>
</tr>
<tr>
<td>– Department Stores</td>
<td>1.6</td>
</tr>
<tr>
<td>– Jewelry Stores</td>
<td>2.8</td>
</tr>
</tbody>
</table>
Receivables Turnover Ratios

Accounts Receivable Turnover =

\[
\frac{\text{Sales (Net)}}{\text{Average Accounts Receivable}}
\]

Days Sales in Accounts Receivables =

\[
\frac{365}{\text{Accts Receivable Turnover}}
\]
Inventory Turnover Ratios

Inventory Turnover = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}

Days Sales in Inventory = \frac{365}{\text{Inventory Turnover}}
Payables Turnover Ratios

Accounts Payable Turnover = \[
\frac{\text{Purchases}*}{\text{Average Accounts Payable}}
\]

Days Purchases in AP = \[
\frac{365}{\text{Accounts Payable Turnover}}
\]

*purchases = CGS + EI - BI
Operating Cycle

◆ The cash to cash cycle

purchase inventory → sell inventory → collect on sale

◆ Approximately:
  
  Days Sales in A/R + Days Sales in Inventory

◆ Including ‘the float’:
  
  o ‘days financing required’ =
    
    Days Sales in A/R + Days Sales in Inventory – Days Payables Outstanding
### Operating Cycle for Kohl’s

<table>
<thead>
<tr>
<th>Metric</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days Rec</td>
<td>46.306</td>
<td>69.025</td>
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<td>Days Inv</td>
<td>55.617</td>
<td>88.295</td>
</tr>
<tr>
<td>Days Pay</td>
<td>-23.043</td>
<td>-41.458</td>
</tr>
<tr>
<td>Net</td>
<td>78.880</td>
<td>115.862</td>
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Long-Term Solvency Risk

- Interested in prospective debt paying ability
  - profitability (ROA, ROE)
    » and future prospects
  - amount of debt outstanding
    » financial leverage
Debt Load

Long Term Debt to Total Assets Ratio =

\[
\frac{\text{Total Long-Term Debt}}{\text{Total Assets}}
\]

Long Term Debt to Equity =

\[
\frac{\text{Total Long-Term Debt}}{\text{Total Common Equity}}
\]
Long-Term Solvency Risk

Interest Coverage Ratio =

\[
\frac{\text{Earnings Before Interest and Income Taxes}}{\text{Interest Expense}}
\]

Operating Cash Flow (OCF) to Cash Interest Cost =

\[
\frac{\text{OCF} + \text{Cash Paid for Interest} + \text{Taxes}}{\text{Cash Paid for Interest}}
\]
Predicting/Explaining Ratio Results

- What if different measures provide conflicting signals?
  - can use multivariate statistical models
    » powerful predictive tools
      - combine signals from individual measures
        - synergy
Prediction Models

◆ Altman’s Z score model (MDA)
  – old (1968) but easy, reliable and robust

\[
Z = 1.2 \left( \frac{WC}{Assets} \right) + 1.4 \left( \frac{R/E}{Assets} \right) + 3.3 \left( \frac{EBIT}{Assets} \right) + 0.6 \left( \frac{MV \text{ Equity}}{Liabilities} \right) + 1.0 \left( \frac{Sales}{Assets} \right)
\]

◆ Marketed to banks and others
  – interpretation
    » above 3.0—low probability
    » between 3.0 and 1.81—moderate probability
    » below 1.81—high probability
Probability of Bankruptcy from EXCEL using NORMSDIST (1-Z score)

P5.17, part a

**Altman’s Z-Score for Harvard Industries, Year 5**

<table>
<thead>
<tr>
<th>Component</th>
<th>Formula</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Capital/Assets</td>
<td>$195,417 - $176,000 / $662,262</td>
<td>.035</td>
</tr>
<tr>
<td>Retained Earnings/Assets</td>
<td>($115,596 / $662,262)</td>
<td>-0.244</td>
</tr>
<tr>
<td>EBIT/Assets</td>
<td>$40,258 / $662,262</td>
<td>0.201</td>
</tr>
<tr>
<td>Mkt. Value Equity/Liabilities</td>
<td>(6,995 x $100.50 / $624,817)</td>
<td>0.675</td>
</tr>
<tr>
<td>Sales/Assets</td>
<td>$631,832 / $662,262</td>
<td>0.954</td>
</tr>
<tr>
<td><strong>Z-Score</strong></td>
<td></td>
<td>1.621</td>
</tr>
</tbody>
</table>

**Probability of Bankruptcy** 26.7%

**Year 6**

<table>
<thead>
<tr>
<th>Component</th>
<th>Formula</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Capital/Assets</td>
<td>$156,226 - $163,384 / $617,705</td>
<td>-0.014</td>
</tr>
<tr>
<td>Retained Earnings/Assets</td>
<td>($184,308 / $617,705)</td>
<td>-0.418</td>
</tr>
<tr>
<td>EBIT/Assets</td>
<td>($11,012 / $617,705)</td>
<td>-0.059</td>
</tr>
<tr>
<td>Mkt. Value Equity/Liabilities</td>
<td>(7,014 x $85 / $648,934)</td>
<td>0.551</td>
</tr>
<tr>
<td>Sales/Assets</td>
<td>($824,835 / $617,705)</td>
<td>1.335</td>
</tr>
<tr>
<td><strong>Z-Score</strong></td>
<td></td>
<td>1.395</td>
</tr>
</tbody>
</table>

**Probability of Bankruptcy** 34.6%
Probability of Bankruptcy from EXCEL using NORMSDIST (1-Z score)

P5.17, part a

Altman’s Z-Score for Marvel Entertainment
Year 5
Working Capital/Assets: 1.2[($490,600 – $318,100)/$1,226,310]...... 0.169
Retained Earnings/Assets: 1.4($114,100/$1,226,310).............................. 0.130
EBIT/Assets: 3.3($25,100/$1,226,310).................................................. 0.068
Mkt. Value Equity/Liabilities: .6[(101,703 x $10.625)/$948,100]...... 0.684
Sales/Assets: 1.0($828,900/$1,226,310).................................................. 0.676
Z-Score............................................................................... 1.727

Probability of Bankruptcy................................................................... 23.4%

Year 6
Working Capital/Assets: 1.2[($399,500 – $345,800)/$844,000]...... 0.076
Retained Earnings/Assets: 1.4(−$350,300/$844,000)............................ −0.581
EBIT/Assets: 3.3(−$370,200/$844,000).................................................. −1.447
Mkt. Value Equity/Liabilities: .6[(101,810 x $1.625)/$999,700]...... 0.099
Sales/Assets: 1.0($745,400/$844,000).................................................. 0.883
Z-Score............................................................................... −0.970

Probability of Bankruptcy................................................................... 97.6%
Predicting/Explaining Credit Risk

- Substantial follow-up research
  - increasingly ‘proprietary’

- Important refinements
  - cost of misclassification
  - focus on distress not bankruptcy
Cost of Misclassification

- Altman’s 1.81 cutoff value?
  - cutoff probability value ≈ 20%
    » implied 4:1 cost ratio

- Recent estimates range as high as 50:1
Defining Failure

◆ Bankruptcy the focus in early studies
  - actually a remedy for default
    » alternative remedies
      ◆ troubled debt restructuring (work out)
      ◆ merger
    » choice based on structural issues
      ◆ merger vs. bankruptcy
        - size
        - leverage
        - management control
      ◆ bankruptcy vs. TDR
        - creditor concentration

◆ Distress is a better definition of failure
Predicting/Explaining Distress

◆ Other issues

– statistical sophistication
  » MDA → LOGIT/PROBIT
  ◆ greater reliability, easier interpretation
Predicting/Explaining Distress

- Important variables (dimensions)
  - profitability (earnings or cash flows)
  - capital investment spending
  - short-term solvency
  - asset turnover (receivables, inventory)
  - long-term debt capacity
  - size
How Reliable are the Financial Statements?

- Presumption they are reliable
  - can be predicted using another model
Predicting Fin. Stmt. Manipulation

◆ Extension of failure prediction methodology
  – Beneish’s 8 factor (probit) model
    » days sales in receivables index
    » gross margin index
    » asset quality index
    » sales growth index
    » depreciation index
    » selling and administrative expense index
    » leverage index
    » total accruals to total assets
Beneish’s y distributed as a cumulative normal function

Table III  Cumulative normal distribution

\[ F(z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-z^2/2} \, dz \]

Example:

\[ P(z < 1.25) = F(1.25) = 0.8944 \]

\[ P(z > 1.25) = 0.1056 \]
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Weighted Predictor Ratios</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Receivable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Days Receivables Index</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
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<td>Current Assets</td>
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<td>Gross Margin Index</td>
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<td>Prop. Plant &amp; Eq-Net</td>
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<td></td>
<td></td>
<td>Asset Quality Index</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
</tr>
<tr>
<td>Total Assets</td>
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<td></td>
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<td>Sales Growth Index</td>
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<td>Current Liabilities</td>
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<td>Depreciation Index</td>
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<td>#VALUE!</td>
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<td>Sell. &amp; Admin. Exp. Index</td>
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<tr>
<td>Sales</td>
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<td></td>
<td>Leverage Index</td>
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<td>#VALUE!</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
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<td></td>
<td></td>
<td></td>
<td>Total Accruals/Total Assets</td>
<td>#DIV/0!</td>
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</tr>
<tr>
<td>Selling &amp; Admin. Exp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Constant</td>
<td>-4.84</td>
<td>-4.84</td>
<td>-4.84</td>
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<tr>
<td>Income from Cont. Oper.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Value of y</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
</tr>
<tr>
<td>Cash Flow from Oper.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Probability of Manipulation</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
<td>#VALUE!</td>
</tr>
</tbody>
</table>
@ 40:1 (Type 1:Type 2) cutoff probability value = 2.94%
What about The Container Store?

- 0.75

High probability of failure

CreditGuru.com
What about The Container Store?

Beneish’s Model

<table>
<thead>
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<th>Company Name</th>
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<tr>
<td>Accounts Receivable</td>
<td>27,476</td>
<td>28,843</td>
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<td>Days Receivables Index</td>
<td>0.99652126</td>
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<tr>
<td>Current Assets</td>
<td>162,685</td>
<td>146,431</td>
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<td>Gross Margin Index</td>
<td>0.52552744</td>
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<tr>
<td>Prop. Plant &amp; Eq-Net</td>
<td>165,498</td>
<td>176,117</td>
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<td>Asset Quality Index</td>
<td>0.40777772</td>
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<tr>
<td>Total Assets</td>
<td>761,834</td>
<td>758,119</td>
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<td></td>
<td>Sales Growth Index</td>
<td>0.86447619</td>
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<tr>
<td>Current Liabilities</td>
<td>113,052</td>
<td>116,003</td>
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<td>Depreciation Index</td>
<td>0.12947784</td>
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<tr>
<td>Long-term Debt</td>
<td>312,026</td>
<td>316,135</td>
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<td>Sell. &amp; Admin. Exp. Index</td>
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<tr>
<td>Sales</td>
<td>$ 819,930</td>
<td>$ 794,630</td>
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<td>Leverage Index</td>
<td>-0.334060</td>
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<td>Cost of Goods Sold</td>
<td>343,860</td>
<td>331,079</td>
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<td>Total Accruals/Total Assets</td>
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<td>387,948</td>
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<td>Value of y</td>
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<tr>
<td>Cash Flow from Oper.</td>
<td>44,639</td>
<td>42,307</td>
<td></td>
<td></td>
<td>Probability of Manipulation</td>
<td>0.00557261</td>
</tr>
<tr>
<td>Depreciation</td>
<td>37,124</td>
<td>34,230</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

@ 40:1 (Type 1:Type 2) cutoff probability value = 2.94%
What about The Container Store?

Stock
Price
Trend

![Stock Price Trend Chart]
What About Small Business Settings?

◆ Ratio analysis still makes good sense
  – be careful using previous models on small firms
    » because they were developed based on large publicly held firms
    » small firms can experience dramatic fluctuations in profits year-to-year
      ◆ lack of product/service portfolios
Summary

◆ Financial distress
  – traumatic outcome for investors and creditors
    » focus of dynamic analyses
      ◆ lots of tools at their disposal
        – ratios
        – statistical models
  – for companies in trouble
    » outsiders probably already know
      ◆ important to solve problems
        – restore profitable operations
      ◆ reassure creditors and investors