The Super Project

Tobey
Overview

- Case Summary
- Problem Statement
- ROFE & Capital Budgeting
- Incredible Incremental
- Analysis Options
- Cash Flows
- Recommendations
Case Summary

- General Foods is a large corporation organized by Product Lines.
- Super is a proposed new instant desert, based on a “flavored, water-soluble, agglomerated powder.”
- General Foods has numerous projects with strict criteria to judge worthiness.
- There are basically three types of Capital Investment proposals at General Foods: Safety, Quality, **Increased Profit**
  - Increased Profit: Cost Reduction, Capacity, **New Product**
    - **Max 10 years payback**: as low as 20% PBT
    - … if expected to be permanent product addition
    - … if facilities highly reconfigurable

- Three analysis types: Incremental, Facilities-based and Fully Allocated.
Problem Statement

• Above all, Super’s worthiness as a capital investment must be evaluated according to General Foods’ accepted criteria.

• Memos indicate that General Foods’ finance personnel are questioning the same criteria’s ability to accurately reflect the value of the Super project.

• This is not an accounting exercise. In accounting, one tries to track and attribute all sources of costs. Also, one alters transaction timings to match expenses with income.

• This is a capital budgeting exercise. We’re interested in cash flows to judge the value of a project, and when those cash flows occur.

• Therefore, our team must 1) evaluate the pertinence of each of the analysis types to Super; and 2) evaluate the worthiness of the Super project.
General Foods – ROFE

• GF uses Return On Funds Employed (ROFE) to evaluate the viability of capital projects, and to weigh one project against another to determine prioritization.

• What is ROFE?

\[ \text{ROFE} = \frac{\text{EBIT}}{\text{Capital Invested (book value)}} \]

• A financial performance metric, ROFE captures a simple relationship
  • Ratio of EARNINGS created from the book value of capital invested
• Using EBIT, does not capture net operating cash flow
• Uses Book value (depreciated value) of capital investments
  • If capital assets are depreciated, they appear to create a cash flow
  • Depreciation is an Accounting Expense not a Cash Flow.
  • Artificially biases long-term asset-intensive projects, as they have bigger apparent depreciation cash flows
• Does not capture the time value of money; interest and inflation

ROFE is not a tool to evaluate capital projects. Even used as a metric to compare capital earnings performance, has flaws.
Capital Budgeting

In **Capital Budgeting** you do not evaluate earnings, you evaluate cash flows. Why?

“You can’t spend out of earnings, you can’t eat out of earnings, and you can’t pay dividends out of earnings. You can do these things only out of cash flow.” - Ross, Westerfield, Jaffe

To evaluate cash flows, we must account for the time-value of money: Discount future cash flows for interest and inflation. How?

**NPV**

**Which Cash Flows?**

Capital Budgeting is specifically about Incremental Cash Flows

“[Incremental cash flows are] the changes in the firm’s cash flows that occur as a direct consequence of accepting the project” - Ross, Westerfield, Jaffe
Decisions Decisions

• Capital budgeting decisions about Super contain externalities
  • Cost of the market study
  • Facilities used from the Jell-O project
  • SG&A overhead for GF corporate

• Confusion about how to make these decisions
  • The GF Accounting and Financial Manual specifies, “capital project requests be prepared on an incremental basis.”
  • “What I learned about incremental analysis at the Business School doesn’t always work.” - Crosby Sanberg, GF
  • “Although the existing facilities utilized by Super are not incremental to this project, they are relevant.” - Crosby Sanberg, GF

• If you add non-incremental items to Super, shouldn’t you balance the equation and account for changes to the Jell-O project?

• Where do you draw the line? Should not be arbitrary.

• To make good decisions, a well defined framework is required to reliably apply rules to decision making
**Incredible Incrementals**

**Incremental Analysis**

It is important to determine which cash flows are incremental and which are *not* because non-incremental cash flows are not relevant to the project.

How do we know which cash flows are incremental cash flows?

\[
\text{Incremental Cash Flow} = \text{total firm cash flow WITH the project} - \text{total firm cash flow WITHOUT the project}
\]

Source: Professor Tim Thompson, Kellogg School of Management
http://www.kellogg.northwestern.edu/faculty/thompsnt/htm/emp/Investment%20Evaluation%20Abridged.ppt
Incredible Incrementals

Examine cash flows decisions

- Changes in net working capital
- Capital Expenditures for fixed assets
- Depreciation is not cash flow, but must be factored into taxation
- Ignore sunk costs
- Include effects of the project on the rest of the firm: erosion or enhancement
- Include Overhead costs
- Account for opportunity costs
- Recaptured working capital recovered after shutdown
- Net proceeds (after taxes) from salvage value due to the sale of capital assets after shutdown
Summary Option 1

“Incremental” Basis

- This evaluation method for Super considers only the "directly identified" incremental revenue, expenditure and investment.
- Incremental fixed capital is $200K
- Project payback period 7 years
- ROFE 63%
Analysis Option 1
“Incremental” Basis

• This execution of Incremental Basis is flawed because it:
  
  • Includes *sunk* costs (the marketing study)
  
  • Fails to account for relevant increasing *overhead*
  
  • Fails to take into account income-tax-reducing *depreciation* on the income statement.
  
  • Utilizes ROFE. Again, ROFE is *no good for capital budgeting*
Summary Option 2
Facilities-used Basis

- Option 1 + Opportunity cost.
  - Super will use 1/2 of Jell-O’s agglomerator
  - Super will use 2/3 of Jell-O’s building
- Super “pro-rata” share is $453 K
- Charges Super with the facility overhead ($28k p/y).
- ROFE 34%
Analysis Option 2
Facilities-used Basis

• Facilities Basis is the WRONG choice for Super because:

  • Option 2 *shifts costs ($453K in facilities) to Super*, which is an accounting maneuver and pointless for cashflow

  • It’s a “net zero” method since it just moves costs

  • *Useful for accounting; for capital budgeting, irrelevant.*
Summary Option 3

Fully Allocated Basis

• Option 1 +Option 2+ OH
  • OH expenses:
    • Manufacturing costs,
    • Selling, general and administrative costs
  • OH Capital: Distribution system Assets
• ROFE 25%
Analysis Option 3

Fully Allocated Basis

- Fully-Allocated is the WRONG choice for Super because:
  - Gives the most inclusive analysis of existing cash flow
    - Adds overhead correctly
  - But, includes Option 1 + Option 2
Recommendations

• General Foods should utilize a true Incremental Analysis to evaluate the Super project.

  • GF can do this by:
    1. Taking into account incremental cash flows,
    2. Modifying their income statement to deduct depreciation before calculating tax,
    3. Ignore sunk costs (marketing test, jell-o facilities, etc.),
    4. Remove depreciation from capital assets for purposes of evaluation,
    5. Accept overhead from growth/doubling powdered dessert line

• General Foods should conclude that the NPV of Super is $51K (10 years, no shutdown) and $71K (10 yrs, with shutdown)

• This is a worthwhile (profitable) project in the following circumstances: 1) It goes at least 10 years in its current facilities; 2) If General Foods moves production, we must be willing to absorb sunk costs of that year’s NPV value.

• There are additional cashflows to be considered if the project is shut down before 10 yrs (Jell-O expands into the space)
The NPV is positive for 10% discount rate <IRR of 11.4%
## Cash Flows

### Hybrid

<table>
<thead>
<tr>
<th>Year</th>
<th>NPV</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>($383)</td>
<td>--</td>
</tr>
<tr>
<td>Year 2</td>
<td>($420)</td>
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<tr>
<td>Year 3</td>
<td>($446)</td>
<td>--</td>
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<tr>
<td>Year 4</td>
<td>($411)</td>
<td>--</td>
</tr>
<tr>
<td>Year 5</td>
<td>($316)</td>
<td>--</td>
</tr>
<tr>
<td>Year 6</td>
<td>($237)</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Year 7</td>
<td>($158)</td>
<td>4.3%</td>
</tr>
<tr>
<td>Year 8</td>
<td>($81)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Year 9</td>
<td>($4)</td>
<td>9.9%</td>
</tr>
<tr>
<td>Year 10</td>
<td>$71</td>
<td>11.7%</td>
</tr>
</tbody>
</table>

← NPV Shutdown Schedule

- Our “hybrid” just corrects procedural errors in option 1, but includes additional cash flows from 2 and 3.

- Can reevaluate NPV projections during any year where capital expansion necessary.
Questions
Recommendations

- $200 for high speed filling/packaging equip., finish packing room
- $360k market test – Incremental test – irrelevant
- Opportunity cost for Jell-O’s facilities and equipment
  - Not relevant – same opportunity for any project using this building
  - Specialized hardware, limited opportunity to sell/lease agglomerator capacity, bad decision to make available to competition
  - From corporate standpoint, hard sell to move in some business to utilize temporarily excess Jell-O facilities, low feasibility
- Capital depreciation – Non-cash expense – irrelevant
- Capital depreciation expense tax deduction – relevant to operating cash flow
- Shift $453k pro-rata share of Jell-O facilities and agglomerator – Incremental test - irrelevant
- $28k avg. yearly depreciation of Jell-O facilities – Incremental test - irrelevant
- $19k business expansion capital for distribution system (per 5) – Incremental test – relevant
- Expansion capital depreciation expense tax deduction – relevant to operating cash flow
- $90k avg. additional yearly overhead expense (per 5-10) for business expansion – Incremental test – relevant
# Appendix

## Annual Sales - Estimated

(In thousands, $000)

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
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<tbody>
<tr>
<td>Units</td>
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<td>1,300</td>
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<td>1,600</td>
<td>1,600</td>
<td>1,700</td>
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<td>Unit price ($0)</td>
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<td>$2</td>
<td>$2</td>
<td>$2</td>
<td>$2</td>
<td>$2</td>
<td>$2</td>
<td>$2</td>
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<td>Sales</td>
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<td>$2,800</td>
<td>$3,000</td>
<td>$3,000</td>
<td>$3,200</td>
<td>$3,200</td>
<td>$3,400</td>
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<tr>
<td>Deductions</td>
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<td>$96</td>
<td>$104</td>
<td>$112</td>
<td>$120</td>
<td>$120</td>
<td>$128</td>
<td>$128</td>
<td>$136</td>
<td>$136</td>
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<tr>
<td>Net Sales</td>
<td>$2,112</td>
<td>$2,304</td>
<td>$2,496</td>
<td>$2,688</td>
<td>$2,880</td>
<td>$2,880</td>
<td>$3,072</td>
<td>$3,072</td>
<td>$3,264</td>
<td>$3,264</td>
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</table>
## Annual Costs - Estimated

(In thousands, $000)

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit cost ($0)</td>
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<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
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<td>$1</td>
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<td>$1</td>
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<td>COGS</td>
<td>$1,100</td>
<td>$1,200</td>
<td>$1,300</td>
<td>$1,400</td>
<td>$1,500</td>
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<td>$1,600</td>
<td>$1,600</td>
<td>$1,700</td>
<td>$1,700</td>
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<td>Startup Exp.</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Marketing</td>
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<td>$1,050</td>
<td>$1,000</td>
<td>$900</td>
<td>$700</td>
<td>$700</td>
<td>$730</td>
<td>$730</td>
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<td>$750</td>
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<tr>
<td>Overhead Exp.</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>$90</td>
<td>$90</td>
<td>$90</td>
<td>$90</td>
<td>$90</td>
<td>$90</td>
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<td>Erosion</td>
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<td>$200</td>
<td>$210</td>
<td>$220</td>
<td>$230</td>
<td>$230</td>
<td>$240</td>
<td>$240</td>
<td>$250</td>
<td>$250</td>
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<tr>
<td>Total Costs</td>
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<td>$2,450</td>
<td>$2,510</td>
<td>$2,520</td>
<td>$2,520</td>
<td>$2,520</td>
<td>$2,660</td>
<td>$2,660</td>
<td>$2,790</td>
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## Appendix

### Operating Cash Flows

(In thousands, $000)

<table>
<thead>
<tr>
<th>Tax Rate</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
<th>10 yr Avg</th>
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</thead>
<tbody>
<tr>
<td>51.80%</td>
<td>$2,112</td>
<td>$2,304</td>
<td>$2,496</td>
<td>$2,688</td>
<td>$2,880</td>
<td>$2,880</td>
<td>$3,072</td>
<td>$3,072</td>
<td>$3,264</td>
<td>$3,264</td>
<td>$3,264</td>
</tr>
</tbody>
</table>

| Sales (net) | $2,112 | $2,304 | $2,496 | $2,688 | $2,880 | $2,880 | $3,072 | $3,072 | $3,264 | $3,264 |
| Costs       | $2,395 | $2,450 | $2,510 | $2,520 | $2,520 | $2,520 | $2,660 | $2,660 | $2,790 | $2,790 |
| Depr.       | $19    | $18    | $17    | $16    | $16    | $14    | $13    | $12    | $11    | $10     |
| EBT         | ($302) | ($164) | ($31)  | $152   | $344   | $346   | $399   | $400   | $463   | $464    | $207      |
| Taxes       | ($156) | ($85)  | ($16)  | $79    | $178   | $179   | $207   | $207   | $240   | $240    |
| Net Income  | ($146) | ($79)  | ($15)  | $73    | $166   | $167   | $192   | $193   | $223   | $224    |
| + Depr.     | $19    | $18    | $17    | $16    | $16    | $14    | $13    | $12    | $11    | $10     |
| Invst Credit| ($1)  | ($1)  | ($1)  | ($1)  | ($1)  | ($1)  | ($1)  | ($1)  |
| Net Op. CF  | ($126) | ($60)  | $3     | $90    | $183   | $182   | $206   | $206   | $234   | $234    |
## Net Working Capital

(In thousands, $000)

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
<th>10 yr Avg</th>
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<tr>
<td>A/R</td>
<td>124</td>
<td>134</td>
<td>142</td>
<td>157</td>
<td>160</td>
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<td>169</td>
<td>169</td>
<td>178</td>
<td>178</td>
<td>178</td>
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<tr>
<td>Inventory</td>
<td>207</td>
<td>222</td>
<td>237</td>
<td>251</td>
<td>266</td>
<td>266</td>
<td>281</td>
<td>281</td>
<td>296</td>
<td>296</td>
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<td>Curr. Liab</td>
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<td>($82.00)</td>
<td>($108.00)</td>
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<td>($185.00)</td>
<td>($184.00)</td>
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<td>($195.00)</td>
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<td>($207.00)</td>
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<td>Total NWC</td>
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<td>274</td>
<td>271</td>
<td>270</td>
<td>241</td>
<td>242</td>
<td>255</td>
<td>255</td>
<td>267</td>
<td>267</td>
<td>$267</td>
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</table>

## Cash Flows due to Investments in Net Working Capital (NWC)

(In thousands, $000)

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
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<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
<th>Shutdown</th>
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<tr>
<td>NWC CF</td>
<td>($329)</td>
<td>$55</td>
<td>$3</td>
<td>$1</td>
<td>$29</td>
<td>($1)</td>
<td>($13)</td>
<td>$0</td>
<td>($12)</td>
<td>$0</td>
<td>$267</td>
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</table>

$267
## Appendix

**Net Cash Flows**  
(In thousands, $000)

<table>
<thead>
<tr>
<th></th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
</tr>
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<tbody>
<tr>
<td><strong>Cap Ex</strong></td>
<td>$(200)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$(19)</td>
<td>0</td>
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<td>0</td>
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<td>$0</td>
</tr>
<tr>
<td><strong>Op. CF</strong></td>
<td>$(126)</td>
<td>$(60)</td>
<td>$3</td>
<td>$90</td>
<td>$183</td>
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<td>$206</td>
<td>$206</td>
<td>$234</td>
<td>$234</td>
<td></td>
</tr>
<tr>
<td><strong>NWC CF</strong></td>
<td>$(329)</td>
<td>$55</td>
<td>$3</td>
<td>$1</td>
<td>$29</td>
<td>$(1)</td>
<td>$(13)</td>
<td>$0</td>
<td>$(12)</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td><strong>Net CF</strong></td>
<td>$(200)</td>
<td>$(455)</td>
<td>$(5)</td>
<td>$6</td>
<td>$91</td>
<td>$193</td>
<td>$181</td>
<td>$193</td>
<td>$206</td>
<td>$222</td>
<td>$234</td>
</tr>
<tr>
<td><strong>Cumulative CF</strong></td>
<td>$(200)</td>
<td>$(655)</td>
<td>$(660)</td>
<td>$(654)</td>
<td>$(562)</td>
<td>$(369)</td>
<td>$(188)</td>
<td>$5</td>
<td>$211</td>
<td>$433</td>
<td>$667</td>
</tr>
<tr>
<td><strong>Payback (Years)</strong></td>
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<td></td>
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</tbody>
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**Discount rate**  
10%

**NPV =**  
$50.96

**IRR =**  
11.4%

**ROFE***  
43.36%
### NVP vs. ROFE

Using a discount rate of 10%

<table>
<thead>
<tr>
<th></th>
<th>Incremental Analysis</th>
<th>Incremental Analysis (w/shutdown)</th>
<th>Option II: Facilities-use Basis</th>
<th>Option III: Fully Allocated Basis</th>
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</thead>
<tbody>
<tr>
<td>ROFE</td>
<td>43.3%</td>
<td>43.3%</td>
<td>25.3%</td>
<td>19.24%</td>
</tr>
<tr>
<td>NPV ($000)</td>
<td>$51</td>
<td>$157</td>
<td>($241)</td>
<td>($382)</td>
</tr>
<tr>
<td>IRR</td>
<td>11.4%</td>
<td>13.8%</td>
<td>6.2%</td>
<td>3.6%</td>
</tr>
</tbody>
</table>
Super’s Value

“A much lower return might be acceptable for a new product entry which represented a continuing effort to maintain leadership in an existing business by, for example, filling out the product line.” - Sanberg

Compelling factors for low return projects

• Reasonably permanent product?
  • Will it become a market fixture in the long run?
• When Jell-O grows, can we move Super in 7 years
  • Is there enough market for Super big justify the capital requirements?
  • Potential pricing currently unsure, may be able to charge higher prices down the road
• Are the facilities highly reconfigurable?
  • The facilities can be converted to Jell-O and the high-speed packing and filling moved or reused for another project
Super’s Value

What does Super represent?
• An expansion or broadening of market capture by appealing to somewhat parallel consumer need
• Not 100% parallel, as will erode Jell-O sales, but return 260% of the Jell-O losses. Don’t know relative profitability of those sales.
• Jell-O agglomerator and plant capacity has uncaptured potential, and will continue to be so for some way into the future.
• Eventually Jell-O will reach a roughly stable market share and future growth will be based on expanding market size, which is much slower
• Super a different concept, requires high-speed packaging and agglomeration
Take advantage of short term availability of Jell-O facilities
“in the long term it is not a better project just because it fits a facility that is temporarily unused.”
May be able to use Jell-O building for other projects, but fails to capture use of Jell-O agglomerator
Opportunity Costs

Opportunity cost of Jell-O facilities: Building and Agglomerator
• Exact same opportunity cost for ANY project that would utilize the same space – therefore the differential is zero.
• Some projects would only leverage use of existing building and not agglomerator, resulting in lower utilization of available assets.
• Agglomerator has few specialized uses for GF, thus there isn’t much opportunity. Certainly wouldn’t lease/sell excess cap to competitor.
• Building has more potential use. As indicated in documentation, likely sized to take advantage of assumed future needs, excess size was justified with ownership benefit vs. lease.
• Leasing to another company creates issues when desired to utilize it in the future, therefore best opportunity is other GF projects

Though implementation of IA, wrong, their logic is well directed
“Crosby concludes that the fully allocated basis, or some variation of it, is necessary to understand the long-range potential of the project.”