

# How the Simulation is Scored

How performance in the Capstone Simulation results in a simulation grade

The base Capstone Simulation point score is generated as outlined below. You may access your Round and Cumulative score during Team Competition on the CapSim website at Reports → Analysis & Scoring → Analyst Report. This document outlines how the 10-item scoring method will be used. Your grade for the team or Individual Competitions will be simply your total points earned divided by the maximum points earned by a student or team (Individual or Team Competitions) in the **same** industry (simulation number). Large classes may have two industries organized in them.

## Margin

Margin points are earned in three areas.

1. **Contribution Margin Percentage** (Up to 33 1/3 points). Each product with a contribution margin greater than 30% earns points. If all products have contribution margins greater than 30%, you earn 33 1/3 points.
2. **Net Margin Percentage** (Up to 33 1/3 points). Each product with a net margin greater than 20% earns points. If all products have margins greater than 20%, you earn 33 1/3 points.
3. **ROS** or Return On Sales (Up to 33 1/3 points). ROS is defined as (Net Profit / Total Sales). ROS looks at the entire company's after tax margins. You earn 33 1/3 points for an ROS of 10% or greater. You earn nothing for a negative ROS. An ROS between 1% and 10% is scaled. For example, an ROS of 5% would earn 16.65 points.

To be considered for contribution and net margins, a product must start the year with a plant and begin making sales on January 1. Products that are in R&D at the beginning of the year are ignored.

Why do margins matter? And why focus upon Contribution Margin, Net Margin, and Return On Sales? To simplify things, let's consider an example where you have only one product.

| <i>REVENUE (\$000)</i>     | <b>Awsum</b>      | <b>Product</b>  | <b>Awsum</b> |
|----------------------------|-------------------|-----------------|--------------|
| Sales                      | \$30,000          | Price           | \$30.00      |
| <i>VARIABLE COSTS</i>      |                   | Labor           | \$7.00       |
| Direct Labor               | \$7,000           | Material        | \$11.50      |
| Direct Material            | \$11,500          | Inventory Carry | \$0.50       |
| Inventory Carry            | \$500             | Unit Margin     | \$11.00      |
| Total Variable Costs       | \$19,000          | Units Sold      | 1,000,000    |
| <b>Contribution margin</b> | \$11,000    36.7% |                 |              |
| <i>PERIOD COSTS</i>        |                   |                 |              |
| Depreciation               | \$2,000           |                 |              |
| SG&A: R&D                  | \$500             |                 |              |
| Promotion                  | \$1,300           |                 |              |

|                          |         |       |
|--------------------------|---------|-------|
| Sales                    | \$1,100 |       |
| Admin                    | \$300   |       |
| Total Period Costs       | \$5,200 |       |
| <b>Net Margin</b>        | \$5,800 | 19.3% |
| Other (fees, write-offs) | \$100   |       |
| EBIT                     | \$5,700 |       |
| Interest                 | \$2,500 |       |
| Taxes                    | \$1,120 |       |
| Profit Sharing           | \$50    |       |
| Net Profit               | \$2,030 | 6.8%  |

### Example

Contribution Margin is defined as Sales less Variable Costs. Variable Costs are the expenses that are tied to the sale of each unit. They are recognized when a unit is sold. Because the number of units you sell varies with demand, they are called Variable Costs. In the example above you sold 1 million units. If you had sold 2 million, your Variable Costs would have been \$38 million, but if you sold 500 thousand, they would be only \$9.5 million.

In short, you do not know your Variable Costs until the sales numbers arrive.

Period Costs, on the other hand, are not tied to sales. In the example above, you spent \$5.2 million on Period Costs whether you sold anything or not. While you could not say what your Variable Costs were until December 31st, the Period Costs were known on January 1st.

Net Margin is defined as Contribution Margin less Period Costs. Put simply, it is what the product contributes towards profits.

From the combined Net Margin (normally across all products) you pay the expenses that cannot be allocated to a product. First comes "Other" (expenses like brokerage fees), then Interest, Taxes, and Profit Sharing until you are left with a Net Profit.

What is critical here?

Have another look at the example. Notice that all the expenses from the PERIOD COSTS label down are either fixed or a percentage of profits. The moment you submit your decisions, everything but Profit Sharing and Taxes is known, and they only occur if you produce a profit. Those known expenses total ( $\$5,200 + \$100 + \$2,500 = \$7,800$ ) or \$7.8 million. If your Contribution Margin cannot cover \$7.8 million, you are destroying wealth instead of creating it.

In the big picture, you cannot have a decent ROS unless your Net Margin Percentage is good, and you cannot have a good Net Margin Percentage unless your Contribution Margin Percentage is healthy. In Capstone's industry, this translates to a 10% ROS, 20% Net Margin, and 30% Contribution Margin.

Finally, consider your detailed Income Statement in your Annual Report. Typically, some of your products are producing healthy margins, while others are slim to negative. Your task is to improve

the margins on the poor performers. Are Period Costs too high? Are Sales, and therefore the Contribution Margin, too low?

## Profits

The Profit category examines the rate at which wealth is being created. Where margins look at percentages, this category examines the actual value of the profit. Because the industry is growing, the profit required to earn 100 points increases each year.

|        |              |        |              |
|--------|--------------|--------|--------------|
| Year 1 | \$6 million  | Year 5 | \$16 million |
| Year 2 | \$8 million  | Year 6 | \$21 million |
| Year 3 | \$10 million | Year 7 | \$27 million |
| Year 4 | \$12 million | Year 8 | \$35 million |

For example, if this is Year 1, and your Net Profit is \$3 million, you earned \$3M/\$6M or 50 points. Of course, negative profits earn no points.

You want your profits to be as high as possible. If you are not earning 100 Profit Points, begin your diagnosis by examining your margins.

1. If your ROS is above 5%, chances are the problem is rooted in below average Sales.
2. If your ROS is below 5%, but your Net Margin Percentage is above 20%, you either experienced some extraordinary "Other" expense like a write-off on plant you sold, or you are paying too much Interest.
3. If your Net Margin Percentage is below 20%, but Contribution Margin is above 30%, the problem is heavy expenditures on Depreciation (perhaps you have idle plant) or on SGA (perhaps you are pushing into diminishing returns on your Promo and Sales Budgets).
4. If your Contribution Margin is below 30%, the problem can be traced to some combination of Marketing (customers hate your products), Production (your labor and material costs are too high), or Pricing (you cut the price too much).

## Emergency Loans

The Emergency Loan category is the one category for which you should always earn 100 points.

- 100 points — No emergency loan
- 50 points — Emergency loans to \$5 million
- 20 points — Emergency loans to \$10 million

In the real world emergency loans do not exist. When you run out of cash, you have "a liquidity crisis", "Chapter 11", or simply "Bankruptcy" on your hands. Capstone gives you every benefit of a doubt, and every opportunity to come up with the money to pay your bills, but if you are out of cash on December 31st, "Big Al" arrives to give you just enough cash to bail you out and bring the Cash account to zero.

Emergency loans are closely linked to your working capital policy and forecasting abilities. Most loans are rooted in two mistakes:

1. An unexpected and dramatic expansion in inventory;
2. Funding plant expansion with "excess" working capital. Or worse, forgetting to fund the plant improvements at all.

One can argue that the Emergency Loan category should offer nothing for small emergency loans. After all, if your heart stops beating, blood stops flowing, and you are dead. If Cash no longer flows through your company, it is dead, too.

Still, there are degrees of being dead, as when you compare, say, steak with hamburger. At \$5 million, your corpse is still recognizable, and we award you 50 points. Up to \$10 million, the odor is obnoxious, but we hold our noses and award you 20 points. Beyond \$10 million you have achieved the status of a rotting corpse, and you are awarded no points.

## Working Capital

The Working Capital category examines your reserves. You do not want too much or too little working capital. There are three criteria:

1. You earn 50 points if your Current Ratio is greater than 2.0.
2. You earn another 50 points if your Days of Working Capital lies between 30 and 90 days.
3. You lose your Working Capital points if you had an Emergency Loan.

**Working Capital** = Current Assets minus Current Liabilities.

**Current Ratio** = Current Assets / Current Liabilities = (Cash + A/R + Inventory) / (A/P + Current Debt).

Days of Working Capital = Working Capital / (Sales/365).

For example, in the sample below, you would earn 50 points for a Current Ratio of 3.2, another 50 points for a Working Capital Days of 65, and you would keep the points because you avoided an Emergency Loan.

| ASSETS (\$000)            |                 | LIABILITIES & OWNER'S EQUITY  |                 |
|---------------------------|-----------------|-------------------------------|-----------------|
| <i>Current Assets</i>     |                 | <i>Liabilities</i>            |                 |
| Cash                      | \$1,260         | Accts Payable                 | \$6,291         |
| Accts Receivable          | \$7,522         | Current Debt                  | \$3,500         |
| Inventories               | \$22,388        | <b>Current Liabilities</b>    | <b>\$9,791</b>  |
| <b>Current Assets</b>     | <b>\$31,170</b> | Long Term Debt                | \$39,000        |
|                           |                 | <b>Total Liabilities</b>      | <b>\$48,791</b> |
| <i>Fixed Assets</i>       |                 | <i>Owner's Equity</i>         |                 |
| Plant & Equip.            | \$113,800       | Common Stock                  | \$18,276        |
| Accum. Deprec.            | (\$45,900)      | Retained Earn.                | \$32,003        |
| <b>Total Fixed Assets</b> | <b>\$67,900</b> | <b>Total Equity</b>           | <b>\$50,279</b> |
| <b>TOTAL ASSETS</b>       | <b>\$99,070</b> | <b>TOTAL LIAB. &amp; O.E.</b> | <b>\$99,070</b> |

|                         |           |
|-------------------------|-----------|
| Working Capital         | \$21,378  |
| Current Ratio           | 3.2       |
| Sales (\$000)           | \$120,000 |
| Days of Working Capital | 65.0      |

Example

Why should you be keenly concerned with Working Capital? Let's take a closer look at the dynamics.

One needs to make a distinction between "The Company" and "The People That Have a Claim on the Company". The Balance Sheet makes this clear. The Assets are The Company, and they are listed on the left side. The Liabilities and Owner's Equity on the right side represent the people that paid for the Assets and their current stake. If a bulldozer scraped the Assets into a pile, it would consist of cash, invoices, inventory, bricks, and equipment. Next to the pile a row of people would line up to make a claim — a vendor, banker, bondholder, stockholder, and (representing Retained Earnings) a manager. This is why a Balance Sheet always balances. The left is "what is owned", the right is "who owns it".

Take another look at the Assets. They are split into two categories, Fixed and Current. At a deep level, the Fixed Assets create wealth. The Current Assets could be characterized as "a cost of doing business" or worse as "a necessary evil". In a perfect world, you would have \$1 of Cash, \$1 of Accounts Receivable, and \$1 of Inventory. Indeed, these are often goals for just-in-time initiatives. Cash creates insignificant wealth (and in Capstone you do not even earn interest). Accounts Receivable is a loan given to customers. Unsold Inventory consumes resources and costs money to carry.

In the example above, \$31 million is locked in Current Assets. If you could put that money to work at, say, 10%, you would earn \$3.1 million.

Why give that up? The argument for Accounts Receivable terms (say 30 days) is that it increases demand, and at some point the profits from the increased demand are greater than the cost of the money we are lending to customers. However, if every competitor offers 30 days, you get no additional gain in demand, yet bear the cost of the loans you give customers. You only see increased demand if there is a spread between your policy and competitors. Typically, you cannot reduce your policy because you would see a decrease in demand.

Inventory and Cash must be considered together. You can think of inventory as crystallized Cash. If you sell the Inventory, it is converted back to Cash. If demand is below expectations, Cash is converted to Inventory. Since you cannot predict what competitors will do, you cannot predict demand perfectly. (This will be explored further in the Forecasting section of this report.) Therefore, your Cash plus Inventory position is a hedge against two risks — the risk of stocking out, and the risk of building too much inventory.

The \$31 million in Current Assets came out of somebody's pocket. Naturally, owners and managers want to know how much was funded from their equity (common stock and retained earnings), and how much from the two relevant debt holders, bankers (current debt) and vendors (accounts payable). Working Capital is the Equity portion that came from owners and managers, and Current Liabilities is the Debt portion.

Equity holders and debt holders have competing interests.

Equity holders would prefer to minimize Working Capital. There are two methods at their disposal — fund Current Assets with debt, or reduce Current Assets.

Let's explore funding Current Assets with debt. Debt holders worry that if they fund too much of the Current Assets, the company might default during difficult times. Debt holders monitor the situation with the Current Ratio.

Current Ratio = Current Assets / Current Liabilities.

Where Working Capital looks at the issue from the Equity holder's perspective (how much of my Equity is in use), the Current Ratio is looking at the issue from the Debt holder's perspective. If the Current Ratio is 2.0, for every \$2 of Current Assets, you have \$1 of Current Liabilities and therefore \$1 of Equity invested. If it is 3.0, then for every \$3 of Current Assets there is only \$1 from Debt holders. The bigger the number, the less the risk faced by Debt holders.

A Current Ratio of 1.0 means Current Assets are entirely funded with Current Liabilities. Bankers and vendors hate to see your Current Ratio at 1.0 because if anything goes wrong, you cannot pay your bills, and this puts them in the awkward position of either giving you more money or letting you go bankrupt. As the Current Ratio rises towards 2.0 they become less worried.

Now let's examine reducing Current Assets. Consider these cases:

Sales \$100,000

CASE 1

| ASSETS (\$000)        |          | LIABILITIES & OWNER'S EQUITY |          |
|-----------------------|----------|------------------------------|----------|
| <i>Current Assets</i> |          | <i>Liabilities</i>           |          |
| Cash                  | \$6,500  | Accts Payable                | \$6,000  |
| Accts Receivable      | \$7,000  | Current Debt                 | \$4,000  |
| Inventories           | \$6,500  | <b>Current Liabilities</b>   | \$10,000 |
| <b>Current Assets</b> | \$20,000 |                              |          |
| Current Ratio         | 2.0      | Days of Working Capital      | 36.5     |

CASE 2

| ASSETS (\$000)        |          | LIABILITIES & OWNER'S EQUITY |         |
|-----------------------|----------|------------------------------|---------|
| <i>Current Assets</i> |          | <i>Liabilities</i>           |         |
| Cash                  | \$2,500  | Accts Payable                | \$6,000 |
| Accts Receivable      | \$7,000  | Current Debt                 | \$0     |
| Inventories           | \$2,500  | <b>Current Liabilities</b>   | \$6,000 |
| <b>Current Assets</b> | \$12,000 |                              |         |
| Current Ratio         | 2.0      | Days of Working Capital      | 21.9    |

Case 1 and 2

Case 1 and 2 both have Current Ratios of 2.0, but Case 2 is much more worrisome. If demand increases, you stock out after selling only \$2.5 million of inventory. If demand falls, you run out of cash after building only \$2.5 million of additional inventory. You have little room for error.

To a degree, this issue is exposed in the Working Capital magnitude. Case 1 features Working Capital of \$10 million; Case 2 only \$6 million. Yet this ignores the question of how much Working Capital you really need. That is driven by sales volume over time. For a small company, \$6 million might be adequate and \$10 million too much. For a large company, \$10 million might be too little.

Days of Working Capital = Working Capital / (Sales/365).

This issue is addressed in "Days of Working Capital", defined as Working Capital / (Sales/365), or more simply, the number of days we could operate before our Working Capital would be consumed. You get 50 points if your Days of Working Capital falls between 30 days and 90 days.

In the example above, where sales are \$100 million per year, Case 1 features 36.5 Days of Working Capital. That is a bit on the thin side, but within acceptable limits. Case 2 is too thin at 21.9 Days of Working Capital.

#### CASE 3

| ASSETS (\$000)        |                 | LIABILITIES & OWNER'S EQUITY |                 |
|-----------------------|-----------------|------------------------------|-----------------|
| <i>Current Assets</i> |                 | <i>Liabilities</i>           |                 |
| Cash                  | \$0             | Accts Payable                | \$6,000         |
| Accts Receivable      | \$7,000         | Current Debt                 | \$4,500         |
| Inventories           | \$14,000        | <b>Current Liabilities</b>   | <b>\$10,500</b> |
| <b>Current Assets</b> | <b>\$21,000</b> |                              |                 |
| Current Ratio         | 2.0             | Days of Working Capital      | 38.3            |

#### Case 3

Case 3 is a variation on Case 1. It illustrates what can happen when you start with thin reserves. There are 38.3 Days of Working Capital, and the Current Ratio is 2.0. Things look okay, but notice that you have no Cash. Our sales forecast was too optimistic. Inventory accumulated beyond our worst case, consuming all of our Cash. We were forced to take an Emergency Loan from Big Al. While one could argue that the problem here was forecasting, we were forecasting in an environment where we were tight for Working Capital. A small error resulted in disaster.

To summarize, your Working Capital position is the consequence of a set of policy decisions.

1. What is the minimum Current Assets we require?
2. What is the maximum Current Assets we will accept?
3. How will we fund Current Assets, with debt or equity?

The equity portion is your Working Capital. These policy decisions can be evaluated with the Current Ratio and Days of Working Capital.

## Market Share

The scoring process varies with the number of teams in the industry:

With 6 teams you get 20 points for every team you beat

With 5 teams you get 25 points for every team you beat

Generically, you want high overall market share for three reasons:

1. You began with a sizeable fixed asset base. You want to utilize your plant and equipment to pay for depreciation and service the long-term debt. Idle plant costs money. As it gathers dust, it also hands you a bill for depreciation, interest, and eventually the principal on the funds used to buy the equipment. Therefore, so long as you at least break even, you would prefer to utilize all of your capacity. That implies high sales volume.
2. You began with a large company doing business in every segment. An investor would argue that any strategy you develop, including niche strategies, should produce at least average

sales. For example, a focused strategy should produce higher share in the target segments, enough to compensate for sacrificing positions in abandoned segments.

3. If you make a sale, a competitor did not. This weakens competition over the long haul.

## Forecasting

The Forecasting category examines your ability to forecast demand, build adequate inventories to satisfy demand, and yet not accumulate excessive inventory. Each product contributes towards Forecasting points.

For a product to earn points, it cannot be out of stock on December 31, and it cannot have more than 120 days of inventory in the warehouse. For example, suppose a product sold 365 thousand units this year. It would earn its points if it had at least 1 unit in the warehouse on December 31st and did not have more than 120 thousand units.

To take the pressure off of new products, a product must start the year with a plant and begin making sales on January 1. Products that are in R&D at the beginning of the year are ignored.

Further, if a product's plant is running at maximum utilization (a complete second shift), stock outs are ignored because you could not make any more inventory in that year. Of course, the team should address the problem, but situations arise where a company faces an unexpected industry-wide capacity shortage. For example, a competitor exits a segment, or downsizes a plant. If the company recognized the problem in their forecast, they would run their plant at 200% utilization this year and add sufficient capacity to meet a forecast for next year.

In short, you do not want to stock out, and you do not want to carry too much inventory. Recall the discussion from the Working Capital category. You can think of inventory as crystallized Cash. If you sell the Inventory, it is converted back to Cash. If demand is below expectations, Cash is converted to Inventory. Since you cannot predict what competitors will do, you cannot predict demand perfectly. Therefore, your Cash plus Inventory is a hedge against two risks — the risk of stocking out, and the risk of building too much inventory.

Stock outs are expensive. Carrying excess inventory is expensive. Consider the following situation. You want to forecast sales for Able. As it turns out, demand is 1200. Case 1 underestimates by 200 thousand. Case 2 has only 1 unit left over. Case 3 has 120 days of inventory left over. In all cases unit cost are the same, and the contribution margin is \$10.06 per unit.

|                     |                |
|---------------------|----------------|
| Price               | <b>\$28.00</b> |
| Labor Cost/Unit     | <b>\$7.56</b>  |
| Material Cost/Unit  | <b>\$10.38</b> |
| Total Unit Cost     | <b>\$17.94</b> |
| Contribution Margin | <b>\$10.06</b> |

|                | Case 1    | Case 2       | Case 3   |
|----------------|-----------|--------------|----------|
|                | Stock Out | Just In Time | 120 Days |
| Units Demanded | 1,200     | 1,200        | 1,200    |
| Units Produced | 1,000     | 1,201        | 1,594    |
| Units Sold     | 1,000     | 1,200        | 1,200    |

|                    |     |   |     |
|--------------------|-----|---|-----|
| Units In Inventory | 0   | 1 | 394 |
| Missed Unit Sales  | 200 | 0 | 0   |

Cases

|                 |         |         |         |
|-----------------|---------|---------|---------|
| Cash            | \$7,068 | \$7,066 | \$1     |
| Inventory Value | \$0     | \$2     | \$7,067 |

In Case 1 you stock out and miss sales of 200 thousand units. Notice that the period costs are already covered by the sales that you did make. Therefore, any missed sales would have gotten a free ride on Depreciation, SG&A expense, even associated interest expenses. The missed sales would only incur taxes. In this example, your missed profits are \$1.3 million. In the proformas that drove this example, total profits were \$5.2 million. A small stock out can make a significant difference in Net Profit.

| REVENUE                    | Able           | Able           | Able           |
|----------------------------|----------------|----------------|----------------|
| Sales                      | \$28,000       | \$33,600       | \$33,600       |
| <b>VARIABLE COSTS</b>      |                |                |                |
| Direct Labor               | \$7,556        | \$9,068        | \$9,068        |
| Direct Material            | \$10,378       | \$12,454       | \$12,454       |
| Inventory Carry            | <u>\$0</u>     | <u>\$2</u>     | <u>\$848</u>   |
| Total Variable Costs       | \$17,934       | \$21,523       | \$22,369       |
| <i>Contribution margin</i> | \$10,066       | \$12,077       | \$11,231       |
| <b>PERIOD COSTS</b>        |                |                |                |
| Depreciation               | \$2,880        | \$2,880        | \$2,880        |
| SG&A: R&D                  | \$0            | \$0            | \$0            |
| Promotion                  | \$800          | \$800          | \$800          |
| Sales                      | \$800          | \$800          | \$800          |
| Admin                      | <u>\$245</u>   | <u>\$301</u>   | <u>\$319</u>   |
| Total Period Costs         | \$4,725        | \$4,781        | \$4,799        |
| <i>Net Margin</i>          | <u>\$5,341</u> | <u>\$7,296</u> | <u>\$6,431</u> |

|                   |         |
|-------------------|---------|
| Missed Net Margin | \$2,013 |
| Inventory Carry   | \$0     |
| Taxes             | \$705   |
| Missed Profits    | \$1,308 |

In Case 2 your hopes come true. You build 1201 and 1200 are sold. Inventory Carry costs are miniscule.

In Case 3 your fears are realized. You build 1594 but only sell 1200, leaving 120 days of inventory in the warehouse. This incurs an Inventory Carry cost of \$848 thousand.

As inventory days increases, so do the carrying costs. For purposes of the Forecasting category, we make a policy decision that anything beyond 120 days is excessive. You might want to set tighter limits, say 90 days. Consider the rows labeled "Cash" and "Inventory Value". In all three cases your Working Capital requirements are the same. When the Inventory is sold, it is converted to Cash. When it does not sell, Cash is converted to Inventory. The combined position of \$7.1 million represents a policy decision for 120 days of inventory. As discussed in The Working Capital category, that \$7.1 million is not free. If you could invest it at 10% it would earn \$710 thousand. If you set a policy of 90 days, you would only require \$5.3 million (but you expose yourself to more risk of stock outs.)

You can use your Capstone.xls spreadsheet to examine worst and best case scenarios. The technique is discussed on pages 25-26 of the *Student Guide 2007* and in the tutorials on the CapSim website. To summarize, put your worst case into the Marketing spreadsheet. To produce a 120 day inventory above your worst case, multiply by  $(365+120)/365$  or 1.33 or 4/3rds. Put the result into the Production spreadsheet (less any inventory on hand). For example, if your worst case is 1000 units, and you want a 120 day spread, produce enough to give you an inventory of  $1000 \times 4/3$  or 1333. (For

a 90-day spread, produce 5/4ths or 1.25 times your worst case.)

Each product contributes points. If your company has 3 products, each product can contribute 33 points. If it has 8, each product can contribute 12.5 points.

Note: The more products one has, the less likely it becomes that a company will earn 100 forecasting points. If you have 8 products, you need 8 good forecasts. On the other hand, if your company has fewer products, a missed forecast costs more points. If you have three products, a miss costs 33 points.

## Customer Satisfaction

The Customer Satisfaction category examines your performance from the customer's perspective. Each of your products can earn points if it meets three criteria:

1. It must sell 50 thousand units during the year.
2. It cannot stock out. However, if the product's plant is running at maximum utilization (a complete second shift) the stock out rule is waived. (There are times when a competitor's unforeseen actions could cause capacity shortages.)
3. Its December Customer Survey score must be 30 or more. All products that sell at least one unit during the year are considered. If the company has five products that sold at least one unit, then each product can contribute 20 points. If it has eight products making sales, each product can contribute 12.5 points.

Since some products make sales in two or more segments, the algorithm produces a weighted average. For example, if a product sold 900 units in Traditional with a score of 40, and 100 units in High End with a score of 10, the weighted average would be  $(900*40 + 100*10) / 1000 = 37$ .

A product's December Customer Survey Score is developed using marketing's "4 P's" — **Price, Product, Promotion** and **Place**.

1. **Price and Product.** The Survey evaluates the product against the buying criteria. A perfect score of 100 results when the product:
  - a. Is priced at the bottom of the expected range.
  - b. Is positioned at the Ideal Spot. (Because the segment moves each month, this can occur only once each year.)
  - c. Has an MTBF specification at the top of the expected range.
  - d. Has the ideal Age for that segment. (Because the product ages each month, it can only have the segment ideal once each year.)
2. **Promotion.** Promotion, driven by your promo budget, creates product awareness before customers shop. If customers are not aware of the product, they are less likely to buy, and that drags down the Survey score. If Awareness is 100%, there is no impact upon the score. But if the Awareness is 0%, the score falls by 50%. Products lose  $(1-\text{Awareness})/2$  times their score. For example, a product with 60% Awareness loses  $(100\%-60\%)/2 = 0.2$  or 20% of its score. A perfect product's score would fall from 100 to 80 with 60% Awareness.
3. **Place.** Place is driven by your Sales budget. It examines the question, "How easy is it for customers to work with you during and after the sale?" We measure this with the segment's Accessibility rating. An Accessibility of 30% means that only 30% of customers have an easy time finding a product, talking to a sales person, taking delivery, etc. The Accessibility can drag down a product's Survey score. Products lose  $(1-\text{Accessibility})/2$  times their score.

If a product's Accessibility in the segment is 40%, the score falls by  $(100\%-40\%)/2 = 30\%$ . A perfect product (with perfect Awareness) would see its score fall from 100 to 70 if Accessibility was only 40%.

4. Together, **Price, Product, Promotion** and **Place** drive most of the score. For example, if the product had a great price and design worth 80, but Awareness of 50% and Accessibility of 50%, customers might say, "The design is great and we like the price, but only half of us ever heard of it, and of those, only half could easily take delivery." The net score would be  $80 \times (100\% - 50\% / 2) \times (100\% - 50\% / 2) = 80 \times 75\% \times 75\% = 45$ .
5. However, several remaining factors could cause the score to fall further.
  - a. The Rough Cut factors (pricing outside the range, positioning outside the inner black segment circle, or MTBF below the expected range) can cause the score to fall to zero.
  - b. The Accounts Receivable Policy could cause the score to fall. At zero days (that is, you expect customers to pay cash on delivery) the score falls to 60% of its former value. At 30 days it falls to 95%. At 90 days it keeps 100%.
6. This factor could cause the score to increase.
  - a. "Salesmanship" or sales time. Your Sales Budget drives two factors, Accessibility and Salesmanship. Accessibility examines infrastructure, is subject to diminishing returns, and is remembered from round to round. Salesmanship applies only to this year. The more you spend, the more sales time you allocate to the product. Salesmanship could increase your product's score by up to 15%.

Note that Customer Satisfaction is often at odds with other goals. High scores imply high costs, and that could imply low margins. From a competitive standpoint, your demand is driven by the spread between your score and your competitors' scores. If everyone scores the same, whether at 10 or 50, they sell the same number of units.

## Productivity

The Productivity category examines the productivity of your workforce through the course of the simulation. There are two criteria:

1. Sales/Employee. You can earn up to 50 points by having high sales volume per employee (Sales/Employee = Total Sales dollars / Complement).
2. Profit/Employee. You can earn another 50 points by having high profits per employee (Profit/Employee = Net Profit / Complement).

Sales/Employee is scaled based upon historical results in past semesters with Capstone. If you reach or exceed these targets, you earn 50 points:

|        | Threshold Sales/<br>Employee | Target Sales/<br>Employee |
|--------|------------------------------|---------------------------|
| Year 1 | \$80,000                     | \$160,000                 |
| Year 2 | \$90,000                     | \$180,000                 |
| Year 3 | \$100,000                    | \$200,000                 |
| Year 4 | \$112,500                    | \$225,000                 |
| Year 5 | \$125,000                    | \$250,000                 |
| Year 6 | \$140,000                    | \$280,000                 |

|                  |           |  |
|------------------|-----------|--|
| Year 7 \$157,500 | \$315,000 | You earn points for anything above the threshold. For example, in Year 1, if your sales are \$80,000 or below, you earn nothing for Sales/Employee. At \$120,000/Employee, you earn 25 points, and at \$160,000/Employee you earn 50 points. |
| Year 8 \$177,500 | \$355,000 |  |

You can improve Sales/Employee a couple of ways:

- Excellent forecasting. Complements are tied to the production schedule. If you use employees to put inventory into the warehouse instead of a customer's hands, you add nothing to Sales yet have an increased complement.
- Higher Automation. Increasing automation levels reduces complement.

Profit/Employee is also scaled based upon historical results with Capstone. The threshold is \$0/Employee. If your profits are negative, you earn no points. If you reach or exceed these targets, you earn 50 points:

|        |                            |   |
|--------|----------------------------|---|
|        | Target Profit/<br>Employee | For example, in Year 1, if you have negative profits, you earn no points. At \$5,000/Employee you earn 25 points, and at \$10,000 and above you earn 50 points.                           |
| Year 1 | \$10,000                   |   |
| Year 2 | \$12,000                   | You can improve Profit/Employee many ways, since there are many ways to improve profits. From a productivity standpoint, reducing complement will improve Profit/Employee.                |
| Year 3 | \$14,500                   |   |
| Year 4 | \$17,500                   |   |
| Year 5 | \$21,500                   | However, there is one counter-intuitive relationship you should recognize. To improve Profits/Employee, you would expect to always reduce complement. But consider two cases (see below). |
| Year 6 | \$26,000                   |   |
| Year 7 | \$32,000                   |   |
| Year 8 | \$39,000                   |   |

| <i>REVENUE</i>                | <b>Case 1</b> | <b>Case 2</b> |
|-------------------------------|---------------|---------------|
| Sales                         | \$110,050     | \$135,300     |
| <i>VARIABLE COSTS</i>         |               |               |
| Direct Labor                  | \$31,215      | \$38,330      |
| Direct Material               | \$44,637      | \$55,151      |
| Inventory Carry               | \$1,413       | \$1,390       |
| Total Variable Costs          | \$77,264      | \$94,871      |
| <i>Contribution margin</i>    | \$32,786      | \$40,429      |
| <i>PERIOD COSTS</i>           |               |               |
| Depreciation                  | \$7,587       | \$7,587       |
| SG&A: R&D                     | \$1,958       | \$1,958       |
| Promotion                     | \$4,100       | \$4,100       |
| Sales                         | \$4,070       | \$4,070       |
| Admin                         | \$848         | \$1,186       |
| Total Period Costs            | \$18,562      | \$18,901      |
| Net Margin                    | \$14,223      | \$21,528      |
| Other (Fees, Write Offs, TQM) | \$0           | \$0           |
| EBIT                          | \$14,223      | \$21,528      |
| Interest                      | \$5,395       | \$5,395       |
| Taxes                         | \$3,090       | \$5,647       |
| Profit Sharing                | \$115         | \$210         |

|                          |         |          |
|--------------------------|---------|----------|
| Net Profit               | \$5,624 | \$10,277 |
| Complement               | 707     | 854      |
| Sales/Employee (\$000)   | \$156   | \$158    |
| Profits/Employee (\$000) | \$8     | \$12     |
| Employee Turnover        | 10.0%   | 10.0%    |

### Cases

Both cases were produced with the Capstone.xls. In Case 2 we increase Sales by \$25M. To build the additional units, Complement increases by 147 workers, a whopping 21%. Yet Profits/Employee actually increases from \$8 thousand/Employee to \$12

thousand/Employee.

How can this be? The secret lies in the Period Costs. As Complement increases, Period Costs stay about the same, and Expenses/Employee actually fall. This reflects the more general principal that you want to work resources, including fixed expenses, as hard as possible.

Let's look at another example. Suppose you are running 100% First Shift, but can sell another 20% if you run on Second Shift. The Second Shift labor costs are 50% higher and you require a larger Complement. However, notice that the First Shift has already paid for Period Costs. Anything you produce on Second Shift gets a free ride on the fixed expenses. It is possible that your Second Shift units are more profitable than the First Shift units.

When the HR and Labor Negotiation decisions are turned off, you will not lose points for having a Turnover rate higher than 10%. However, if one or the other is active, you will lose 10 points for every percentage point above 10%. Employee turnover can be kept at 10% by spending money in Recruiting and Training hours. It is driven up by Overtime and dissatisfaction with the labor contract.

## Financial Structure

The Financial Structure category examines the Financial Structure of your company — its relationship between Debt and Equity. Leverage is defined as:

$$\text{Leverage} = \text{Total Assets} / \text{Total Equity}$$

You earn points based upon your Leverage as follows:

| <b>Leverage</b> | <b>Points</b> |  |
|-----------------|---------------|--|
| 1.0 to 1.3      | No Points     | At its basic level, Financial Structure addresses two questions:<br>1. Who is taking the risks?<br>2. Who gets the wealth created by the company?  |
| 1.31 to 1.8     | 50 Points     |  |
| 1.81 to 2.8     | 100 Points    | All stakeholders are keenly concerned with these questions, and as a consequence, responses often take on a political character as stakeholders compete for their share of the wealth being created. Because risk and reward are linked, there is even competition among the stakeholders for the risk. For example, bankers want to loan money, bondholders want to buy bonds, and stockholders want to buy stock issues. |
| 2.81 to 3.3     | 50 Points     |  |
| 3.31+           | No Points     |  |

The Financial Structure of the firm is at the center of this conflict. Let's begin by identifying the stakeholders and their agendas.

We must make a distinction between "The Company" and "The People That Have a Claim on the Company". The Assets are The Company, and they are listed on the left side of the Balance Sheet.

The Liabilities and Owner's Equity on the right side represent the people who paid for the Assets and their current stake. If a bulldozer scraped the Assets into a pile, it would consist of cash, invoices, inventory, bricks, and equipment. Next to the pile a row of people would line up to make a claim a vendor, banker, bondholder, stockholder, and (representing Retained Earnings) a manager. This is why a Balance Sheet always balances. The left is "what is owned"; the right is "who owns it" (see the example below).

| Balance Sheet        |                         | Liab.& Owner's Equity          |                         | Stakeholders       |
|----------------------|-------------------------|--------------------------------|-------------------------|--------------------|
| Cash                 | \$4,262                 | Accounts Payable               | \$7,583                 | Vendors            |
| Accounts Receivable  | \$9,278                 | Current Debt                   | 6,000                   | Bankers            |
| Inventory            | <u>\$11,605</u>         | Long Term Debt                 | <u>\$37,500</u>         | Bondholders        |
| Total Current Assets | \$25,145                | Total Liabilities              | \$48,083                |                    |
| Plant and equipment  | \$113,800               | Common Stock                   | \$20,276                | Stockholders       |
| Accum. Depreciation  | <u>(\$38,313)</u>       | Retained Earnings              | <u>\$29,273</u>         | Mgt & Stockholders |
| Total Fixed Assets   | \$75,487                | Total Equity                   | \$47,549                |                    |
| <b>Total Assets</b>  | <u><b>\$100,632</b></u> | <b>Total Liab. &amp; O. E.</b> | <u><b>\$100,632</b></u> |                    |

#### Example

The Financial Structure of the firm is the relationship between Debt and Equity. The relationship is called "Leverage" because stockholders are matching their equity with debt to create a bigger company.

The Debt versus Equity relationship is so fundamental that three popular definitions for leverage are in common use:

- Debt/Equity
- Debt/Assets
- Assets/Equity

Of these **we prefer Assets/Equity** because it gets at the relationship from an owner's perspective. (Debt/Assets is favored by lenders, and Debt/Equity by Management.)

Key point → Owners are creating Assets (the Company) by matching their Equity with Debt in some proportion.

A Leverage of 3.0 says, "For every \$3 of Assets there is \$1 of Equity."

| Leverage | Assets | Debt | Equity |  |
|----------|--------|------|--------|--|
| 1.0      | \$1    | \$0  | \$1    | When students play Capstone, they often strive to eliminate the Debt and bring Leverage down. They pay off any Current Debt and retire all bonds. Sometimes they set Accounts Payables policy to zero (paying vendors immediately), which eliminates all forms of debt and brings leverage to 1.0. |
| 2.0      | \$2    | \$1  | \$1    |  |
| 3.0      | \$3    | \$2  | \$1    |  |
| 4.0      | \$4    | \$3  | \$1    |  |

In short, they manage the company as they manage their personal finances. This thinking is incorrect at the corporate or business level, especially in the early years of your tenure. It occurs so frequently in Capstone that we should take a moment to compare personal finances with corporate finances.

Consider the example. Without the Debt, the Assets would only be half as big. Instead of a company with \$100 million in Assets, you would have a company with \$50 million. Looking at the Leverage

table, a competitor with identical equity and a Leverage of 2.0 would have twice your assets at their disposal. With a Leverage of 3.0, they would have three times your Assets.

In your personal finances, debt buys non-income producing assets. Interest payments consume your income instead of you. In a business, debt buys income producing assets. If you can borrow money at 10% and make 20%, you should borrow all you can get.

The relevant questions are:

1. Can we find investments that generate a higher return than the cost of the funding?
2. What is the risk that our investments will not produce the expected returns, perhaps even causing us to default on our debt and go bankrupt? The higher the Leverage, the higher the risk.

The amount that you can borrow is limited by debt holders. They know that things can go wrong. For example, you buy capacity, but your competitors introduce new products, and your new capacity sits idle. Debt holders control their risk by charging higher interest rates as Leverage increases, and by setting limits on the amount you can borrow.

Near the end of the simulation, Capstone companies can usually fund plant improvements entirely from profits, and teams are tempted to pay down debt. For example, the company has a \$30 million profit and only needs \$15 million for plant improvements to keep up with industry growth. (Further, it has \$10 million depreciation that could pay for the new plant.) The argument goes, "We do not need more debt to grow our company. We have become a cash cow, and it makes no sense to let cash accumulate. Let's use our excess Working Capital to retire debt, eliminate interest payments and improve profits."

To evaluate this argument, one must recognize that the environment has changed. At the beginning of the simulation, investment opportunities abound and you need new capital to fund them, either debt or equity. Seven or eight years later, the investment opportunities are still there, but you can easily handle them from the wealth you are creating.

Of course, this happens in the real world, too. Any cash cow could pay off its debt to improve profits. They maintain their Leverage for reasons worth exploring.

Capstone highlights an intrinsic competition between Management and Owners (stockholders). By definition, Management owns no stock, and Owners do not manage. Of course, in the real world individuals can do both, but the roles are fundamentally different. Owners accumulate capital and put it at risk. In modern times "owners" include pension funds, mutual funds, venture capitalists, etc. as well as private investors. Managers take the capital and create additional wealth. In principle the new wealth belongs to the owners. In practice, managers want the wealth, too.

In Capstone, your team owns no stock. You are pure Management.

Management has only one method to keep the wealth — retain the profits. Owners can take the wealth out two ways, via dividends and stock appreciation. Management argues against dividends by saying, "Let us keep the profits as Retained Earnings. We will grow the company and Owners will see stock appreciation." Owners listen. They are indifferent to the method so long as their wealth is maximized.

When a company becomes a cash cow, however, the argument that Management can grow the company becomes less persuasive. Assets stabilize. If Retained Earnings go up, Debt must fall and with it Leverage. Owners argue, "If the best you can do with our Retained Earnings is save the interest payment, a paltry 8% or so, we want to put our money into a better investment."

In the real world, Management might counter argue that they can diversify the company, get into new businesses, etc., but this addresses a different question, "What shall we do with the surplus now that the Leverage question has been settled?" Typically cash cows become wholly owned business units, and their managers serve one stockholder, the parent company. When you examine the cash cow's balance sheet, you find it features a healthy leverage — not too much, not too little, just enough to maximize the return to the parent.

Capstone differs from the real world in one important respect — you have a professor, not Owners, to worry about. Your professor may have allowed you to set your own performance measures. This puts a new spin on your situation. Owners and Management have somewhat competing agendas. You may have stacked the deck to favor Management.

Owners evaluate the profits (not the wealth) with two statistics:

- ROE (Return On Equity)
- EPS (Earnings Per Share)

The dollar amount of the profits is actually secondary to Owners, although primary to Management. It is one thing to say, "Our profits were \$10 million", and another to say, "Our profits per share were one dollar."

**ROE** = Profits/Equity = Profits/Assets \* Assets/Equity = ROA \* Leverage.

**EPS** = Profits/Shares Outstanding.

From Management's standpoint, ROA is more useful than ROE, because it indicates how good they are at producing wealth from the Assets. For example, a 10% ROA would delight Management because, if they can retain the earnings, they grew the asset base by 10% in a single year. However, Owner's want a return on the money they invested, their Equity. If Leverage is 1.0 (no debt) their ROE becomes  $10\% * 1.0 = 10\%$ . If Leverage is 2.0, their ROE becomes  $10\% * 2.0 = 20\%$ .

From an Owner's viewpoint, Management should use Leverage to produce higher ROE. The higher returns become EPS. The EPS can now be given to the stockholder as a dividend. This puts cash into the Owner's pocket while increasing the value of the stock. Stock price goes up. Market Capitalization goes up. This is yet another reason why a stockholder would prefer that Management maintain the Leverage and pay out dividends.

If your performance measures favor stockholders, they include ROE, Stock Price, and Market Capitalization. You should maintain Leverage.

However, if your performance measures favor Management, they include ROA (Profit/Assets), ROS (Profit/Sales), and Cumulative Profit. You should reduce Leverage.

The remaining two measures, Asset Turnover and Market Share, are somewhat neutral to Leverage, particularly in the latter years.

For the purposes of the Financial Structure category, stockholder's interests reign supreme. Your Leverage should fall between 1.81 and 2.8. But depending upon the measures you selected, you could find yourself conflicted.

Finally, let's step outside of Capstone and take a look at a pragmatic reason why Management in publicly held companies tends to maintain high Leverage.

Managers wish to keep their jobs. They can lose their jobs two ways. Stockholder's have the power to remove managers for dismal returns. Other managers, corporate raiders, could take over their company and fire them.

Suppose that your company has a Leverage of 1.0 (no debt) and Total Assets of \$150 million. Stock price and market capitalization are below what they would be at a higher Leverage, making the company a bargain. Although this is not possible in the simulation, a real-world raider would recognize that at a Leverage of 2.0, your assets could raise \$150 million, and at a Leverage of 3.0, \$300 million. The details of hostile takeovers vary enormously, but the essential characteristic of this particular deal is that your own debt capacity would be used against you.

## Wealth Creation

Wealth Creation evaluates your ability to create wealth during your tenure as Management. It examines three measures:

- **Cumulative Profits**, the sum of all profits since you took over management of the company;
- **Cumulative Free Cash Flow**, the sum of all of the Free Cash Flows since you took over management of the company;
- **Market Capitalization**, the current value of your stock price times shares outstanding.

Each measure is worth up to 33 1/3 points. Since we are looking at accumulated wealth, the targets increase each year:

|        | Cumulative Profits (\$M) | Cumulative Free Cash Flow (\$M) | Market Capitalization (\$M) |  |
|--------|--------------------------|---------------------------------|-----------------------------|--|
| Year 1 | \$6                      | \$7                             | \$60                        | If you do not reach the target, you can still earn points. For example, if your Year 4 Cumulative Profits is \$18 million, it would earn $18/36 * 33 \frac{1}{3}$ points = 16.65 points. |
| Year 2 | \$14                     | \$10                            | \$66                        |  |
| Year 3 | \$24                     | \$15                            | \$78                        |  |
| Year 4 | \$36                     | \$22                            | \$88                        |  |
| Year 5 | \$52                     | \$31                            | \$110                       | Let's look at each of these measures.  |
| Year 6 | \$73                     | \$42                            | \$140                       |  |
| Year 7 | \$100                    | \$55                            | \$180                       | Profit is the traditional measure of wealth creation. One can describe profit as a common  |
| Year 8 | \$135                    | \$70                            | \$234                       |  |

sense measure, "Was anything left over after we subtract expenses from revenues?" However, profits are limited in two ways.

1. Profits do not look at issues related to additional investment. For example, your CFO comes to you and says, "Boss, I have good news and bad news. The good news is that we made a profit of \$10 million. The bad news is we need to invest \$15 million into new plant and equipment to stay competitive next year."

2. Profits are not directly accessible to stockholders. Owners have only two ways to get the wealth that has been created, dividends and stock appreciation.

Free Cash Flow addresses the first problem. One can describe Free Cash Flow as the money left after investment that a company could either put in the bank or give to shareholders.

Consider "Cash Flows From Operations" from the Cash Flow Statement. It consists of Net Income (that is, profits, the results from the Income Statement), Depreciation (typically we can ignore any "extraordinary" items), and fluctuations in A/R, A/P, and Inventory.

In practice, A/R and A/P tend to cancel each other out (a loan to customers versus a loan from vendors). They rarely fluctuate enough to cause serious damage to cash flow, although they do consume some wealth over the long haul, growing at about the rate of industry growth.

Inventory swings in Capstone (and the real world) can be large, but if you average the swings over several years, they too average towards zero. Therefore, Inventory swings are a Working Capital issue, not a Free Cash Flow issue.

In the end we are left with Profits plus Depreciation plus small fluctuations we can ignore.

| <b>Cash Flow Statement Survey</b>           | <b>Andrews Baldwin Chester</b> |                   |                 |
|---|--------------------------------|-------------------|-----------------|
| <b>Cash flows from operating activities</b> |                                |                   |                 |
| Net Income (Loss)                           | \$708                          | \$5,304           | \$1,572         |
| Adjustment for non-cash items               |                                |                   |                 |
| Depreciation                                | \$8,013                        | \$9,040           | \$7,960         |
| Extraordinary gains/losses/writeoffs        | \$0                            | \$0               | \$251           |
| Changes in current assets and liabilities   |                                |                   |                 |
| Accounts payable                            | (\$1,029)                      | \$6,215           | \$3,425         |
| Inventory                                   | \$3,406                        | (\$4,934)         | (\$1,304)       |
| Accounts receivable                         | \$206                          | (\$3,306)         | (\$383)         |
| Net cash from operations                    | \$11,304                       | \$12,318          | \$11,520        |
| <b>Cash flows from investing activities</b> |                                |                   |                 |
| Plant improvements (net)                    | (\$6,400)                      | (\$25,300)        | (\$12,180)      |
| <b>Cash flows from financing activities</b> |                                |                   |                 |
| Dividends paid                              | \$0                            | \$0               | \$0             |
| Sales of common stock                       | \$0                            | \$5,000           | \$6,000         |
| Purchase of common stock                    | \$0                            | \$0               | \$0             |
| Cash from long term debt issued             | \$0                            | \$10,000          | \$6,000         |
| Retirement of long term debt                | \$0                            | \$0               | \$0             |
| Change in current debt                      | \$0                            | \$0               | \$0             |
| Net cash from financing activities          | \$0                            | \$15,000          | \$12,000        |
| <b>Net Change in Cash Position</b>          | <b>\$4,904</b>                 | <b>\$2,018</b>    | <b>\$11,340</b> |
| <b>Free Cash Flow</b>                       | <b>\$4,904</b>                 | <b>(\$12,982)</b> | <b>(\$660)</b>  |

An Example

Even if profit is small, depreciation would continue to deliver a cash flow from operations. Indeed, in the early years of Capstone, depreciation is usually larger than Profits. However, you never actually write a check for depreciation, yet it was deducted as an expense from your Income Statement. The money is sitting in the cash account like a check that has not been cashed. It follows that the next thing Free Cash Flow must do is subtract capital expenditures, the investments in plant and equipment. If it turns out that you are plowing money back into plant at the same rate you are depreciating it, the whole business reduces back to our old friend, profits.

Still, there is a lot of noise here, and Free Cash Flow cuts through it. If the result is a positive number, then the company is creating wealth. The Free Cash Flow can be used to pay dividends, repurchase stock, or reinvest in the company, any of which delights Owners. If negative, then the company needs to consume somebody's wealth, and there are only three places to get it — working capital (our own wealth), a new stock issue (Owner's wealth), or more debt (Lender's wealth).

In any particular year, swings in inventory or profits could push Free Cash Flow negative, but over several years the swings should cancel out. Therefore, the Wealth Creation category uses cumulative free cash flow to measure your success.

Market Capitalization is the value that the stock market places on the firm — stock price times shares outstanding.

One can argue that Market Cap is a better measure than stock price for evaluating the wealth created by Management. For example, suppose two firms, Andrews and Baldwin, have stock prices of \$100. If Andrews has a Market Cap of \$200 million, and Baldwin \$300 million, then Baldwin created more wealth. Baldwin issued stock to fund its growth, and therefore its stock price is diluted by more shareholders. Nevertheless, its ending stock price is the same. We can infer that Baldwin's EPS, dividend, and book value are similar to Andrews. If that is true, Baldwin's profits must be much higher.