Organizational Design, Responsibility Accounting, and Evaluation of Divisional Performance

Student Tutorial
Most organizations are divided into smaller units, divisions, segments, business units, work centers, or departments which have particular responsibilities.

When do you have GOAL CONGRUENCE?

When the managers of subunits throughout the organization have incentives to perform in the common interest of the organization.

BEHAVIOURAL CONGRUENCE

Performance evaluation and incentive systems are designed to encourage employees to behave as if their goals are congruent with organizational goals.
Decentralized Organizations And Responsibility Accounting

GOAL CONGRUENCE

BEHAVIOURAL CONGRUENCE

RESPONSIBILITY ACCOUNTING

Various concepts and tools used to measure the performance of people and the departments in order to foster goal or behavioural congruence.
Centralization Vs. Decentralization

Centralized Organizations

Decentralized Organizations
Centralization Vs. Decentralization

**Centralized Organizations**
- Decisions are handed down from the top echelon of management and subordinates carry them out.

**Decentralized Organizations**
- Decisions are made at divisional and departmental levels.
Benefits And Costs Of A Decentralized Organization

**BENEFITS**

- Subunit managers are specialists
- Autonomy in decision making provides managerial training
- Managers with decision making authority usually exhibit greater motivation
- Delegating provides time relief to upper-level managers
- Empowering employees draws on the knowledge and expertise of those closest to operations
- Delegating to the lowest level enables a timely response to opportunities and problems

**COSTS**

- Managers sometimes have a narrow focus of their own units’ performance rather than the organization’s overall goals
- The narrow focus may cause managers to tend to ignore the consequences of their actions on the organization’s other subunits
- Some tasks or services may be duplicated unnecessarily
Decentralized Organizations And Responsibility Accounting - Question #1

Which of the following is more characteristic of a decentralized than a centralized organization?

A. Quick response time to changes in local conditions
B. The firm faces a relatively stable environment
C. The firm is relatively small
D. There is little incentive for lower level management to make decisions

Select the Best Answer
Decentralized Organizations And Responsibility Accounting - Question #1

Which of the following is more characteristic of a decentralized than a centralized organization?

A. Quick response time to changes in local conditions
B. The firm faces a relatively stable environment
C. The firm is relatively small
D. There is little incentive for lower level management to make decisions

Congrats!
Decentralized Organizations And Responsibility Accounting - Question #1

Which of the following is more characteristic of a decentralized than a centralized organization?

A. Quick response time to changes in local conditions
B. The firm faces a relatively stable environment
C. The firm is relatively small
D. There is little incentive for lower level management to make decisions

If the environment was stable, one person could run the world. It is instability that gives rise to the need for local decision-making. Try again.
Decentralized Organizations And Responsibility Accounting - Question #1

Which of the following is more characteristic of a decentralized than a centralized organization?

A. Quick response time to changes in local conditions
B. The firm faces a relatively stable environment
C. The firm is relatively small
D. There is little incentive for lower level management to make decisions

If the firm is small, then why would we want to delegate authority to middle management? Try again.
Decentralized Organizations And Responsibility Accounting - Question #1

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Quick response time to changes in local conditions</td>
<td></td>
</tr>
<tr>
<td>B. The firm faces a relatively stable environment</td>
<td></td>
</tr>
<tr>
<td>C. The firm is relatively small</td>
<td></td>
</tr>
<tr>
<td>D. There is little incentive for lower level management to make decisions</td>
<td></td>
</tr>
</tbody>
</table>

Why would you want to put decision-making authority in the hands of unmotivated management? Try again.
Responsibility Accounting

The purpose of a RESPONSIBILITY ACCOUNTING system is to ensure that each manager and worker in the organization is striving toward the overall goals set by top management.

A RESPONSIBILITY CENTER is a subunit in an organization whose manager is held accountable for specified financial and nonfinancial results of the subunit’s activities.

RESPONSIBILITY CENTERS

- Cost Center
- Discretionary Cost Center
- Revenue Center
- Investment Center
- Profit Center
## Responsibility Accounting

### Responsibility Centers

<table>
<thead>
<tr>
<th>Center Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| Cost Center                 | • well-defined input-output relationships  
                              • the manager is responsible for the cost of activities                                      |
| Discretionary Cost Center   | • input-output relationships are not well specified  
                              • the manager is responsible for the cost of activities                                      |
| Revenue Center              | • the manager is responsible for the revenue of the subunit                                                                                 |
| Profit Center               | • the manager is responsible for the subunit’s profit                                                                                     |
| Investment Center           | • the manager is responsible for the profit and the invested capital used to generate the profit                                          |
Organization Chart: Outback Outfitters, Ltd.

Outback Outfitters, Ltd.

- President
- Investment center

Koala camp gear division

- Vice-president
- Investment center

Sydney plant

- General plant manager
- Profit center

Sales department

- Sales dept. manager
- Revenue center

Production department

- Production dept. manager
- Cost center

Packaging work center

- Supervisor of work center
- Cost center
A performance report shows the budgeted and actual amounts of key financial results appropriate for the type or responsibility involved.

Management by exception is used to control an organization’s operations effectively.

Management by exception means management only follows up on the most significant variances.
Activity-Based Responsibility Accounting

Traditional responsibility accounting systems focus on the financial performance measures of cost, revenues, and profit for the subunits of the organization.

Activity-based responsibility systems focus not only on the cost of performing activities but on the activities themselves.
How Does Responsibility Accounting Affect Behaviour

The proper focus of a responsibility system is informational.

Causing managers to react constructively and strive for improved performance.

A responsibility accounting system does not emphasize blame.

Some organizations use performance reports that distinguish between controllable or uncontrollable costs or revenues.

Identifying costs as controllable or uncontrollable is not always easy.

Many costs are influenced by more than one person.

Some costs that are not controllable in the short run become controllable in the long run.
Which of the following is not true about responsibility accounting?

A. Costs are classified on the basis of controllability
B. Identifying costs as controllable or uncontrollable is not always easy
C. Some costs that are not controllable in the short run become controllable in the long run
D. Many costs are influenced by one person
E. A responsibility accounting system does not emphasize blame
Which of the following is **not** true about responsibility accounting?

A. Costs are classified on the basis of controllability
B. Identifying costs as controllable or uncontrollable is not always easy
C. Some costs that are not controllable in the short run become controllable in the long run
D. Many costs are influenced by one person
E. A responsibility accounting system does not emphasize blame

That’s true, but it doesn’t help us to answer the question. Try again.
Decentralized Organizations And Responsibility Accounting - Question #2

Which of the following is not true about responsibility accounting?

A. Costs are classified on the basis of controllability
B. Identifying costs as controllable or uncontrollable is not always easy
C. Some costs that are not controllable in the short run become controllable in the long run
D. Many costs are influenced by one person
E. A responsibility accounting system does not emphasize blame

Of course it isn’t easy, but it isn’t right either. Try again.
### Decentralized Organizations And Responsibility Accounting - Question #2

Which of the following is **not** true about responsibility accounting?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.</strong></td>
<td>Costs are classified on the basis of controllability</td>
</tr>
<tr>
<td><strong>B.</strong></td>
<td>Identifying costs as controllable or uncontrollable <strong>is not always easy</strong></td>
</tr>
<tr>
<td><strong>C.</strong></td>
<td>Some costs that are not controllable in the short run become controllable in the long run</td>
</tr>
<tr>
<td><strong>D.</strong></td>
<td>Many costs are influenced by one person</td>
</tr>
<tr>
<td><strong>E.</strong></td>
<td>A responsibility accounting system does not emphasize blame</td>
</tr>
</tbody>
</table>

If they aren’t controllable in the short run, we can’t hold someone responsible. Try again.
Which of the following is not true about responsibility accounting?

A. Costs are classified on the basis of controllability
B. Identifying costs as controllable or uncontrollable is not always easy
C. Some costs that are not controllable in the short run become controllable in the long run
D. Many costs are influenced by one person
E. A responsibility accounting system does not emphasize blame
Decentralized Organizations And Responsibility Accounting - Question #2

Which of the following is not true about responsibility accounting?

A. Costs are classified on the basis of controllability
B. Identifying costs as controllable or uncontrollable is not always easy
C. Some costs that are not controllable in the short run become controllable in the long run
D. Many costs are influenced by one person
E. A responsibility accounting system does not emphasize blame

That’s just silly. Of course it emphasizes blame. That’s the point, isn’t it? Try again.
Motivating Desired Behaviour

Organizations often use the responsibility accounting system to motivate actions considered desirable by upper-level management.

Sometimes the responsibility accounting system can solve behavioural problems and promote teamwork.

<table>
<thead>
<tr>
<th>Potential Costs of Accepting Rush Order</th>
<th>Potential Benefits of Accepting Rush Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disrupted production</td>
<td>Satisfied customers</td>
</tr>
<tr>
<td>More setups</td>
<td>Greater future sales</td>
</tr>
<tr>
<td>Higher costs</td>
<td></td>
</tr>
<tr>
<td>Need for outsourcing</td>
<td></td>
</tr>
</tbody>
</table>

Production manager looks only at costs.

Sales manager looks only at benefits.

The modified responsibility system made the sales manager look at both the costs and benefits.

Satisfied customers

Greater future sales
Large subunits are usually designated as **INVESTMENT CENTERS**

The manager is held accountable for the **INVESTMENT CENTER’S** profits and the capital invested to earn that profit.

The retail sales manager:

- Approves the overall pricing policies in the retail division’s stores.
- Has the autonomy to sign contracts to buy merchandise for resale.
- Has the authority to build new stores, rent space in shopping centers, or close existing stores.

These decisions influence the amount of capital invested in the division.
## Return On Investment As A Performance Measure

<table>
<thead>
<tr>
<th></th>
<th>Mail Order Division</th>
<th>Koala Camp Gear Division</th>
<th>Retail Division</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales revenue</strong></td>
<td>$350,000,000</td>
<td>$405,000,000</td>
<td>$960,000,000</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td>14,000,000</td>
<td>45,000,000</td>
<td>48,000,000</td>
</tr>
<tr>
<td><strong>Invested capital</strong></td>
<td>70,000,000</td>
<td>300,000,000</td>
<td>480,000,000</td>
</tr>
</tbody>
</table>

Return on investment (ROI) = \[ \frac{\text{Income}}{\text{Invested capital}} \]

### Return on investment (ROI) Calculation

<table>
<thead>
<tr>
<th>Division</th>
<th>Income</th>
<th>Invested capital</th>
<th>ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail-order division</td>
<td>$14,000,000</td>
<td>$70,000,000</td>
<td>20%</td>
</tr>
<tr>
<td>Koala Camp Gear division</td>
<td>$45,000,000</td>
<td>$300,000,000</td>
<td>15%</td>
</tr>
<tr>
<td>Retail division</td>
<td>$48,000,000</td>
<td>$480,000,000</td>
<td>10%</td>
</tr>
</tbody>
</table>
Factors Underlying ROI

Return on investment = \( \frac{\text{Income}}{\text{Invested Capital}} = \frac{\text{Income}}{\text{Sales revenue}} \times \frac{\text{Sales revenue}}{\text{Invested capital}} \)

- **Sales Margin**: Focuses on the number of sales dollars generated by each dollar of invested capital.
- **Capital Turnover**: Measures the percentage of each sales dollar that remains as profit after all expenses are covered.

"Measures the percentage of each sales dollar that remains as profit after all expenses are covered"
Factors Underlying ROI

Return on investment = \frac{Income}{Invested Capital} = \frac{Income}{Sales revenue} \times \frac{Sales revenue}{Invested capital}

Focuses on the number of sales dollars generated by each dollar of invested capital

Measures the percentage of each sales dollar that remains as profit after all expenses are covered

Sales Margin \times Capital Turnover

Mail-order division
- Sales revenue: $14,000,000
- Invested Capital: $350,000,000
- Income: $70,000,000
- Margin: \frac{70,000,000}{14,000,000} = 50%

Koala Camp Gear division
- Sales revenue: $45,000,000
- Invested Capital: $405,000,000
- Income: $300,000,000
- Margin: \frac{300,000,000}{45,000,000} = 66.67%

Retail division
- Sales revenue: $48,000,000
- Invested Capital: $960,000,000
- Income: $480,000,000
- Margin: \frac{480,000,000}{48,000,000} = 100%
Improving A Division’s ROI

Current retail division ROI:
- Retail division’s ROI: 10%
- Sales margin: 5%
- Capital turnover: 2

Improved retail division ROI:
- Retail division’s ROI: 14%
- Sales margin: 7%
- Capital turnover: 2

Increase sales margin:
- Increase sales price while selling less quantity or decrease expenses

Increase sales revenues or reduce the division’s invested capital:
- Retail division’s ROI: 15%
- Sales margin: 5%
- Capital turnover: 3

Increase capital turnover.
Return on Investment

Cookeville Corporation has provided the following information:
Sales: $1,000,000
Income: $250,000
Assets: $5,000,000

<table>
<thead>
<tr>
<th>Compute Cookeville Corporation’s Profit Margin</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compute Cookeville Corporation’s Asset Turnover Ratio</td>
<td>?</td>
</tr>
</tbody>
</table>

Return on Investment

Cookeville Corporation has provided the following information:
- Sales: $1,000,000
- Income: $250,000
- Assets: $5,000,000

| Compute Cookeville Corporation’s Profit Margin | $250,000 ÷ $1,000,000 = 25% |
| Compute Cookeville Corporation’s Asset Turnover Ratio | $1,000,000 ÷ $5,000,000 = 20% |
Cookeville Corporation has provided the following information:

- Sales: $1,000,000
- Income: $250,000
- Assets: $5,000,000

Compute Cookeville Corporation’s Return on Investment
Cookeville Corporation has provided the following information:
- Sales: $1,000,000
- Income: $250,000
- Assets: $5,000,000

Compute Cookeville Corporation’s Return on Investment

Profit Margin × Asset Turnover = ROI
25% × 20% = 5%
## Residual Income As A Performance Measure

<table>
<thead>
<tr>
<th>Cost of investment in CIM = $50,000,000</th>
<th>Results in annual operating savings of $5,500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on investment in new equipment</td>
<td>Increase in divisional profit = 5,500,000</td>
</tr>
<tr>
<td></td>
<td>Increase in invested capital = $50,000,000 = 11%</td>
</tr>
</tbody>
</table>

The company’s cost of capital = 10%

### Koala Camp Gear Division’s Return on Investment

<table>
<thead>
<tr>
<th>Without Investment in New Equipment</th>
<th>With Investment in New Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$45,000,000</td>
<td>$45,000,000 + $5,500,000</td>
</tr>
<tr>
<td>$300,000,000 = 15%</td>
<td>$300,000,000 + $50,000,000 &lt; 15%</td>
</tr>
</tbody>
</table>

Averaging the new investment with that already in place reduces the division’s overall ROI.
## Residual Income As A Performance Measure

### Koala Camp Gear Division’s Residual Income

<table>
<thead>
<tr>
<th></th>
<th>Without Investment in New CIM Equipment</th>
<th>With Investment in New CIM Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisional profit</td>
<td>$45,000,000</td>
<td>$50,500,000</td>
</tr>
<tr>
<td>Less imputed interest charge: Invested capital</td>
<td>$300,000,000</td>
<td>$350,000,000</td>
</tr>
<tr>
<td>X imputed interest rate</td>
<td>x .10</td>
<td>x .10</td>
</tr>
<tr>
<td>Imputed interest charge</td>
<td>30,000,000</td>
<td>35,000,000</td>
</tr>
<tr>
<td>Residual charge</td>
<td>$15,000,000</td>
<td>$15,500,000</td>
</tr>
</tbody>
</table>

**Investment in new equipment raises residual income by $500,000**
## Residual Income As A Performance Measure

### Comparison of Residual Income: Two Divisions

<table>
<thead>
<tr>
<th></th>
<th>Mail-Order Division</th>
<th>Koala Camp Gear Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisional profit</td>
<td>$45,000,000</td>
<td>$50,500,000</td>
</tr>
<tr>
<td>Less imputed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>interest charge:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invested capital</td>
<td>$300,000,000</td>
<td>$350,000,000</td>
</tr>
<tr>
<td>Imputed interest rate</td>
<td>x .10</td>
<td>x .10</td>
</tr>
<tr>
<td>Imputed interest charge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual charge</td>
<td>$15,000,000</td>
<td>$15,500,000</td>
</tr>
</tbody>
</table>

The Koala Camp Gear division’s residual income is much higher simply because it is larger than the mail-order division.
Residual Income As A Performance Measure

The Byrdstown Corporation has the following two divisions:

<table>
<thead>
<tr>
<th></th>
<th>DIVISION A</th>
<th>DIVISION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,500,000</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Total variable costs</td>
<td>500,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>250,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Average assets invested</td>
<td>2,000,000</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

Assume a 10% target return on investment

Compute divisional residual income
Residual Income As A Performance Measure

<table>
<thead>
<tr>
<th></th>
<th>DIVISION A</th>
<th>DIVISION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,500,000</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Total variable costs</td>
<td>500,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>250,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Average assets invested</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,000,000 X 10% =</td>
<td>$200,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>3,000,000 X 10% =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual Income</td>
<td>$550,000</td>
<td>$200,000</td>
</tr>
</tbody>
</table>
## Residual Income As A Performance Measure

<table>
<thead>
<tr>
<th></th>
<th>DIVISION A</th>
<th>DIVISION B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>$1,500,000</td>
<td>$2,000,000</td>
</tr>
<tr>
<td><strong>-Total variable costs</strong></td>
<td>500,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td><strong>-Total fixed costs</strong></td>
<td>250,000</td>
<td>500,000</td>
</tr>
<tr>
<td><strong>Average assets invested</strong></td>
<td>$200,000</td>
<td>$300,000</td>
</tr>
<tr>
<td><strong>Residual Income</strong></td>
<td>$550,000</td>
<td>$200,000</td>
</tr>
</tbody>
</table>

Assume that Division B has the opportunity to make an investment in an asset costing $500,000 which will save $55,000. Assume an income of $500,000.
Residual Income As A Performance Measure

Cost of investment in CIM = $500,000
Results in annual operating savings of $55,000

Return on investment in new equipment = Increase in divisional profit
Increase in invested capital = $55,000 / $500,000 = 11%

The company’s cost of capital = 10%

Division B’s Return on Investment

Without Investment in New Equipment

$500,000 / $3,000,000 = 16.67%

With Investment in New Equipment

$500,000 + $50,000 / $3,000,000 + $500,000 = 15.7%

Averaging the new investment with that already in place reduces the division’s overall ROI
Residual Income As A Performance Measure

<table>
<thead>
<tr>
<th>DIVISION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
</tr>
<tr>
<td>- Total variable costs</td>
</tr>
<tr>
<td>- Total fixed costs</td>
</tr>
<tr>
<td>Average assets invested</td>
</tr>
<tr>
<td>3,000,000 X 10% = $300,000</td>
</tr>
<tr>
<td>+ $500,000</td>
</tr>
<tr>
<td>Residual Income</td>
</tr>
</tbody>
</table>

The investment increases residual income
Economic Value Added (EVA) As A Performance Measure

What does an EVA analysis tell us?

How much shareholder wealth is being created

EVA

Economic value added = Investment center’s after-tax operating profit - Investment center’s total assets - Investment center’s current liabilities \times \text{Weighted-average cost of capital}

Two sources of long-term capital: debt and equity

How does EVA differ from residual income?
Weighted Average Cost Of Capital

Weighted average cost of capital = \[
\frac{\text{After-tax cost of debt capital} \times \text{Market value of debt} + \text{Cost of equity capital} \times \text{Market value of equity}}{\text{Market value of debt} + \text{Market value of equity}}
\]

\[
= \frac{0.063 \times 400,000,000 + 0.12 \times 600,000,000}{400,000,000 + 600,000,000}
\]

\[
= \frac{24,600,000 + 72,000,000}{1,000,000,000}
\]

\[
= 0.0972
\]
Economic Value Added For Outback

<table>
<thead>
<tr>
<th>Division</th>
<th>Current Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail-Order</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>Koala Camp Gear</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Retail</td>
<td>9,000,000</td>
</tr>
</tbody>
</table>

Outback Outfitters has $20 million in current liabilities

Investment center’s after-tax operating profit - Investment center’s total assets - Investment center’s current liabilities \( \times \) Weighted-average cost of capital = Economic value added

<table>
<thead>
<tr>
<th>Division</th>
<th>After-tax Operating Profit</th>
<th>Investment Center’s Total Assets</th>
<th>Investment Center’s Current Liabilities</th>
<th>Weighted-average Cost of Capital</th>
<th>Economic Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail-order</td>
<td>$14 \times (1 - .30) -</td>
<td>($70 - $6) \times .0972</td>
<td></td>
<td></td>
<td>$3,579,200</td>
</tr>
<tr>
<td>Koala Camp Gear</td>
<td>$45 \times (1 - .30) -</td>
<td>($300 - $5) \times .0972</td>
<td></td>
<td></td>
<td>$2,826,000</td>
</tr>
<tr>
<td>Retail</td>
<td>$48 \times (1 - .30) -</td>
<td>($480 - $9) \times .0972</td>
<td></td>
<td></td>
<td>$(12,181,200)</td>
</tr>
</tbody>
</table>
Weighted Average Cost Of Capital

Chattanooga Manufacturing Company has the following capital structure:
- Bonds - market value: $5,000,000
- After-tax cost of debt capital: 6.5%
- Common stock - market value: $10,000,000
- Cost of equity capital: 10.0%
Weighted Average Cost Of Capital

\[
\text{Weighted average cost of capital} = \frac{\text{After-tax cost of debt capital} \times \text{Market value of debt} + \text{Cost of equity capital} \times \text{Market value of equity}}{\text{Market value of debt} + \text{Market value of equity}}
\]

\[
\begin{align*}
&= \frac{.065 \times 5,000,000 + .10 \times 10,000,000}{5,000,000 + 10,000,000} \\
&= .08833
\end{align*}
\]
Economic Value Added (EVA) As A Performance Measure

Assume the Chattanooga Manufacturing Company has two divisions with the following data:

<table>
<thead>
<tr>
<th>Division</th>
<th>Current Liabilities</th>
<th>After-Tax Operating Income</th>
<th>Total Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division A</td>
<td>$1,000,000</td>
<td>$5,000,000</td>
<td>$8,000,000</td>
</tr>
<tr>
<td>Division B</td>
<td>$2,000,000</td>
<td>$1,000,000</td>
<td>$15,000,000</td>
</tr>
</tbody>
</table>

Economic value added = Investment center’s after-tax operating profit - Investment center’s total assets - Investment center’s current liabilities × Weighted-average cost of capital
### Economic Value Added (EVA) As A Performance Measure

Assume the Chattanooga Manufacturing Company has two divisions with the following data:

<table>
<thead>
<tr>
<th>Division</th>
<th>Current Liabilities</th>
<th>After-Tax Operating Income</th>
<th>Total Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division A</td>
<td>$1,000,000</td>
<td>$5,000,000</td>
<td>$8,000,000</td>
</tr>
<tr>
<td>Division B</td>
<td>$2,000,000</td>
<td>$1,000,000</td>
<td>$15,000,000</td>
</tr>
</tbody>
</table>

After-Tax Operating Income:

- Division A: $5,000,000
- Division B: $1,000,000

WACC:

- Division A: \[\left(\frac{($1,000,000 - $8,000,000)}{X} \times .08833\right)\]
- Division B: \[\left(\frac{($2,000,000 - $15,000,000)}{X} \times .08833\right)\]
## Economic Value Added (EVA) As A Performance Measure

<table>
<thead>
<tr>
<th>Division</th>
<th>After-Tax Operating Income</th>
<th>Current Liabilities</th>
<th>Total Assets</th>
<th>WACC</th>
<th>EVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division A:</td>
<td>$5,000,000</td>
<td>-</td>
<td>$8,000,000</td>
<td>.08833</td>
<td>$4,381,690</td>
</tr>
<tr>
<td>Division B:</td>
<td>$1,000,000</td>
<td>-</td>
<td>$15,000,000</td>
<td>.08833</td>
<td>$ (148,290)</td>
</tr>
</tbody>
</table>

Division B is not creating shareholder wealth.
What Is The Division’s Invested Capital?

Total assets

Appropriate if the division manager has considerable authority in making decisions about all of the division’s assets, including nonproductive assets.

Total productive assets

Appropriate if the division manager has been directed by top level management to keep nonproductive assets in progress, making it appropriate to exclude nonproductive assets from the measure of invested capital.

Total assets less current liabilities

Appropriate if the division manager has authority to secure short-term bank loans and other short-term credit.
## Assets - Gross Or Net Book Value

<table>
<thead>
<tr>
<th>Current assets (cash, accounts receivable, inventories, etc.)</th>
<th>$34,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-lived assets (land, buildings, equipment, vehicles, etc.)</td>
<td>( \text{Gross book value (acquisition cost)} ) $304,000,000</td>
</tr>
<tr>
<td></td>
<td>Less: Accumulated depreciation ( 64,000,000 )</td>
</tr>
<tr>
<td></td>
<td>Net book value ( 240,000,000 )</td>
</tr>
<tr>
<td></td>
<td>Plant under construction ( 26,000,000 )</td>
</tr>
<tr>
<td></td>
<td>Total assets ( \text{at gross} ) $364,000,000</td>
</tr>
</tbody>
</table>

Gross book value is acquisition value less accumulated depreciation.

Net book value is acquisition value less accumulated depreciation.
Net Book Value Versus Gross Book Value

Advantages of net book value; disadvantages of gross book value

- Using net book value maintains consistency with the balance sheet prepared for external reporting purposes
- Using net book value to measure invested capital is also more consistent with the definition of income, which is the numerator in ROI calculations

Advantages of gross book value; disadvantages of net book value

- The usual methods of computing depreciation are arbitrary and should not be allowed to affect ROI, residual income, or EVA calculations
- When long lived assets are depreciated, their net book value declines over time, resulting in a misleading increase in ROI, residual income, and EVA across time
### Methods Of Measuring Investment-Center Income

The key issue is controllability; the choice involves the extent to which uncontrollable items are allowed to influence the income measure.

<table>
<thead>
<tr>
<th>Formula</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue</td>
<td>Less: unit-level, batch-level, product-level and customer-level expense</td>
</tr>
<tr>
<td></td>
<td>= (1) Divisional contribution margin</td>
</tr>
<tr>
<td>Less: general and facility-level expenses controllable by division manager</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= (2) Profit margin controllable by division manager</td>
</tr>
<tr>
<td>Less: general and facility-level expenses, traceable to division, but controlled by others</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= (3) Profit margin traceable to division</td>
</tr>
<tr>
<td>Less: common general and facility-level expenses, allocated from company headquarters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= (4) Divisional income before interest and taxes</td>
</tr>
<tr>
<td>Less: Interest expense allocated from company headquarters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= (5) Divisional income before taxes</td>
</tr>
<tr>
<td>Less: income taxes allocated from company headquarters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= (6) Divisional net income</td>
</tr>
</tbody>
</table>
Alternatives To ROI, Residual Income And EVA

- **ROI**
  - Residual Income
  - EVA

- **Short-run performance measures**

- **Multiperiod viewpoint**
  - Takes into account the timing of cash flows in the investment
  - Actual divisional profit for a time period is compared to a flexible budget and variances are used to analyze performance
  - The division’s major investments are evaluated through a postaudit of the investment decisions

End of Chapter 19

At least my division did well. I wonder how the whole company did?