Presented by
STEVEN L. BLAKE, CPA, CFE, CICA, CGMA
SLBCPA@CHARTER.NET  864-680-6191

Key Financial Management Concepts

AGENDA
• 8:45 BEGIN
• 10:00 TAKE A 10 MINUTE BREAK
• 12-12:15 LUNCH (COURSE WILL CONTINUE THROUGH LUNCH TIME AS LUNCH IS HERE)
• 2:00 TAKE A 10 MINUTE BREAK
• 4:00 END

What is Financial Management in Government?
Public Service Organizations and Financial Management

- Why should public service organizations be concerned about financial management?
- Should public service organizations make a "profit"?
- How can financial information be used to help managers make decisions?
- Financial management provides information that helps managers focus on questions of survival, effectiveness, and efficiency. What do we mean by effectiveness and efficiency?

What is Financial Management?

- The part of the management process that focuses on financial information that can be used to improve decision making.
- Includes
  - Finance: the management of the sources and uses of resources within an organization.
  - Accounting:
    - Managerial: the generation of financial information for planning and decision making.
    - Financial: a system for tracking and reporting the resources owned and used by an organization.

What is Public Finance?

- Government policies related to spending, taxing, and borrowing decisions.
- Government role in:
  - Allocating Resources
  - Distributing Resources
  - Stabilizing the Economy
- Adjusting Free Market Economy Outcomes
  - Market Failure
  - Redistribution
  - Tax and Expenditure Efficiency and Equity
The Focuses of Public Service and For-Profit Organizations

- For-profit or proprietary organizations focus on maximizing the wealth of the owners of the organization.
- Public service organizations focus on achieving "mission-centered" goals while maintaining a "satisfactory financial condition."
- Some organizations are both for-profit and public service - they must balance the goals of maximizing profits with the goals of providing public service.
  - For example: for-profit schools, prisons, hospitals

Federal Receipts by Source for Year Ending September 30, 2014

Federal Outlays by Category for Year Ending September 30, 2014
State and Local Receipts for the Year 2010, in Percent

- Intergovernmental: 37%
- Sales and Gross Receipts Taxes: 30%
- Property Taxes: 6%
- Individual Income Taxes: 2%
- Other Taxes: 2%
- Charges and Misc. Receipts: 2%


State and Local Government Outlays for the Year 2012, in Percent

- Education: 28%
- Public Welfare: 15%
- Highways: 2%
- Other: 54%


National Committee on Municipal Accounting (NCMA)
- Established in 1934
  - Municipal Finance Officers Association (MFOA)
    - Later Government Finance Officers Association (GFOA)
  - First “Blue Book” issued in 1936
    - NCMA Bulletin No. 6, Municipal Accounting Statements
National Committee on Governmental Accounting (NCGA)
- Founded in 1948
- Second “Blue Book” issued in 1951
  - NCGA Bulletin No. 14, *Municipal Accounting and Auditing* (1951)
- Third “Blue Book” issued in 1968
  - *Governmental Accounting, Auditing, and Financial Reporting*
    - First to bear the GAAFR title

Transition
- National Council on Governmental Accounting established in 1974
- Result
  - Prior to 1974
    - “Blue Book” source of authoritative GAAP
  - After 1974
    - “Blue Book” no longer sets GAAP
    - Focus henceforth on practical application of authoritative standards

MFOA/GFOA
- Fourth “Blue Book” issued in 1980
- Fifth “Blue Book” issued in 1988
- Sixth “Blue Book” issued in 1995
- Seventh “Blue Book” issued in 2001
- Eighth “Blue Book” issued in 2005
- Ninth “Blue Book” issued in 2011
Summary of a 75-Year Tradition
- 1936 First “Blue Book”
- 1951 Second Blue Book
- 1968 Third Blue Book (first GAAFR)
- 1980 Fourth Blue Book
- 1988 Fifth Blue Book
- 1995 Sixth Blue Book
- 2001 Seventh Blue Book
- 2005 Eighth Blue Book
- 2011 Ninth Blue Book
- GAAFR Supplements [e-book formats $10]

Planning for Success: Budgeting

Overview of Financial Management
- Plan
- Implement
- Control
- Measure Results and Report
**Planning**

- Establish the organization's **mission**. What is an example of an organizational mission?
- Develop a **strategic plan** to meet that mission. The strategic plan is a broad set of organizational goals/objectives and the primary approaches for reaching them. **COSO** measurement criteria relate directly to these goals/objectives.
- Set **long-range plans** for achieving the goals defined in the strategic plan.
- Prepare **budgets** that show how management expects to obtain and use the resources needed to meet those goals.

**Budgets**

- **Master Budget**
  - Operating Budget
    - revenues and other support
    - expenditures
  - Financial Budgets
    - cash budget
    - capital budget
- **Special types of budgets**
  - special purpose budgets
  - performance budgets
  - flexible and zero-based budgets
The Operating Budget

- **Revenue and Other Support** is a forecast of resource inflows into the organization. **Revenues** are earned from the sale of goods and services and the receipt of contributions and grants. **Support** refers to just contributions and grants.
- **Expenditures** represent the resources that an organization uses up in carrying on its activities.
- A surplus or profit is the excess of revenues and support over expenses; a deficit or loss is an excess of expenditures over revenues and support.

Cash Versus Accrual Accounting

- The term “recognition” means that there is an acknowledgment that some financial event has occurred.
- **Cash Accounting** recognizes revenue when payments are received in cash and expenditures when a resource is paid for in cash.
  - **Accrual Accounting** recognizes revenue when the goods or services have been delivered and the organization has earned the right to be paid. Expenses are recognized when a resource has been used in the operation of the organization.

Why Use Accrual Accounting?

- **Accrual accounting** helps an organization match the revenues that it has earned with the resources required to produce those revenues. BETTER TIMING.
- Accrual accounting is more appropriate for measuring the profitability of an organization and is more difficult to manipulate.
The Cash Budget

- **Cash Budgets** plan for an organization’s cash inflows and outflows.

  **Beginning Cash Balance**
  - cash receipts
  - Subtotal: Available Cash
  - cash payments
  - Subtotal: Total Cash Payments
  - Balance before borrowing, repaying or investing
  - Subtotal: Total Cash Payments

- **Ending Cash Balance**
  - Note distinction between accrual-based revenue and expense versus cash receipts and payments/expended!

---

The Capital Budget

- Capital Budgets plan for the acquisition of high-value, long-term (> 1 year) assets. You define what are capital assets.

- **Accrual Accounting and Capital Assets**
  - Accrual expenses reflect the use of a resource.
  - Since capital assets last for many years, it would be inappropriate to show their entire cost as part of the operating budget at the time they are acquired. We show one year’s share of the cost in the operating budget each year it is used, and show the full cost on the capital budget the year the capital asset is acquired.

---

The Capital Budget

- **Three reasons you have a capital budget:**
  - 1) Illogical to include multiyear items on an annual operating budget
  - 2) Because of the sizable outlays, it focuses special attention to the decision making process
  - 3) It also requires special attention related to financing
The Budget Process
- A process of planning and control.
- A look ahead at what an organization can and can't do.

The Budget Cycle
- Preparation
  - based on guidelines
  - normally done by responsibility center managers
- Review and Adoption
- Implementation and Control
- Evaluation of Results and Feedback

Behavioral Aspects of Budgeting
- People are the key to success in budgeting
- Goal Divergence vs Goal Congruence
- Motivation is critical
  - Allow staff input in budget process
  - Provide incentives – carrot or stick
    - Raises
    - Bonus
    - Letter reviewing performance

Forecasting
- Forecasting is an art. Models should be tested before use and experience should be brought to bear when appropriate.
Factors in Revenue Forecasts

- Economic conditions
- Endowment Investment Decisions
- Price Setting
  - historical approach - what we always got.
  - market approach - what others charge.
  - quantity maximization - do as much as possible while staying solvent.

The Human Element in Forecasting

- Consider how the results will be used.
- Is the past a good predictor for the future.
- Does the forecast result make sense?

Two Approaches to Budgeting

- **Centralized or Top Down Model** - Priorities are set at the top of the organization and imposed on the operating units. More control but less staff involvement.
- **Decentralized or Bottom Up Model** - Operating units prepare budgets based on their perceptions of needs. Less control but more involvement. Lots of negotiations. Risk of losing sight of overall objectives.
- Most organizations use hybrid approaches incorporating elements of both methods.
Governmental Budgeting Issues

- Taxing authority.
- Taxing/spending decisions often have policy implications.
- Entitlements and mandates create spending patterns that must be built into budgets.
- **Governmental budgets generally have the force of law:**
  - they restrict managers from spending more than is allocated for their departments.
  - they limit a manager’s ability to move funds from one account to another. Legal level of control.
- Governments must disclose their budgets to the public.

Budgeting Formats

- **Line item** or **object of expense** - e.g., salaries, benefits, supplies, rent, etc.
- **Responsibility Center** - units for which individual managers are held accountable, e.g., custodial services, maintenance, public relations, development, ticket sales, etc.
- **Program Budgets** include both revenues and expenses - ballet, opera, philharmonic, etc.
- Generally, both Responsibility Center and Program budgets are supported by line item detail.

Incremental Versus Zero-Based Budgeting

- **Incremental budgeting** starts with current revenues and expenses and projects next year by adjusting for inflation, volume, efficiency, technology, etc.
- **Zero-Based Budgeting**
  - calls for a total reevaluation of all programs and activities.
  - requires that decision packages be prepared for each separable activity or level of activity.
  - ranks the packages.
  - selects packages for adoption or rejection.
**Flexible Budget**

- Organizations often experience more or less volume than budgeted.
- Flexible budgets look at expected revenues, expenses, and net income under different volume assumptions.
- The key to flexible budgeting is the identification of:
  - **Fixed Costs** - which do not change with volume.
  - **Variable Costs** - which do change with volume.
- Flexible budget results are normally shown in a side-by-side columnar format.
- A flexible budget is a form of "What if?" analysis.

**Understanding Costs**

- It depends! How a manager or policy maker looks at and measures cost depends on why the cost analysis is being done. **What question are we trying to answer?**
- **Cost Objective** is the focus of the cost analysis, the question. It may be a unit of service, a program, or a department.
- **Relevant costs** are those that have an impact on, or are impacted by, the decision being considered. Determining what costs are relevant depends on:
  - the **cost objective**
  - the **time frame** for the analysis.
  - the expected **range of volume**.
Cost Definitions

- **Full or Total Cost** is the sum of all costs associated with the cost objective.
- **Direct Costs**
  - costs incurred within an organizational unit.
  - cost of resources used to produce a good or service.
- **Indirect Costs (Overhead)**
  - costs that are assigned to a unit from outside.
  - costs of resources not used directly to provide service.
- Full cost = direct cost + indirect cost.
- Is a maintenance worker direct or indirect?

More Cost Definitions

- **Average Cost** is the full cost of a cost object divided by the number of units of service provided.
- **Fixed Costs** are those costs which remain (relatively) unchanged in total for some time period as the volume of services changes over a relevant range of activity.
- **Variable Costs** are those costs that vary directly with changes in the volume of service units over a relevant range of activity.
- **Relevant Range** is the normal range of expected activity.

Fixed and Variable Costs

- Fixed Costs do not vary with volume over the relevant range.
- Variable Costs vary proportionately with volume.
The urban planner for Millbridge is working on a housing project. The Fixed Costs are $300,000 for the project, and Variable Costs are $250 each time a family moves into an apartment. The cost structure of the housing project would be:

<table>
<thead>
<tr>
<th>Volume</th>
<th>Fixed Cost</th>
<th>Variable Cost</th>
<th>Total Cost</th>
<th>Average Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>$300,000</td>
<td>$25,000</td>
<td>$325,000</td>
<td>$3,250</td>
</tr>
<tr>
<td>500</td>
<td>$300,000</td>
<td>$125,000</td>
<td>$425,000</td>
<td>$850</td>
</tr>
<tr>
<td>1,500</td>
<td>$300,000</td>
<td>$375,000</td>
<td>$675,000</td>
<td>$450</td>
</tr>
<tr>
<td>2,500</td>
<td>$300,000</td>
<td>$625,000</td>
<td>$925,000</td>
<td>$370</td>
</tr>
<tr>
<td>3,000</td>
<td>$300,000</td>
<td>$750,000</td>
<td>$1,050,000</td>
<td>$350</td>
</tr>
</tbody>
</table>
The housing project now has 2,500 move-ins per year. To encourage the town to expand the program, the state offers to pay $300 for each of 500 move-ins if they expand to 3,000 per year. Should the town expand the housing project?

- The average cost per move-in at 2,500 per year is $370.
- The average cost per move-in at 3,000 per year is $350.
- The variable cost per move-in is $250.

What is your decision?

---

**Break-Even Analysis**

![Break-Even Analysis Graph]

**Deriving the Break-Even Formula**

Total Revenue = price * quantity = $P \times Q$

Total Expense = variable cost + fixed cost = (VC * Q) + FC

Break even occurs when Total Revenue = Total Expense

\[ P \times Q = (VC \times Q) + FC \]

Subtracting (VC * Q) from both sides:

\[ (P - VC) \times Q = FC \]

Factor out Q:

\[ Q = \frac{FC}{P - VC} \]

Divide both sides by (P - VC):

\[ BEQ = \frac{FC}{P - VC} \]

BEQ is the Break-Even Quantity.

(P - VC) is often called the Contribution Margin.
A Break-Even Example

Feed-A-Child Foundation wants to start a new program which will have $30 in variable costs per child and fixed costs of soliciting donations to fund the program of $10,000. If each donor were to give FAC $50, and each donor feeds one child, how many donors would be needed for FAC to break even?

Contribution Margin = (P - VC) = ($50 - $30) = $20
Fixed Costs = $10,000

\[ \text{BEQ} = \frac{\text{FC}}{\text{CM}} = \frac{\$10,000}{\$20} = 500 \text{ donors to break even} \]

Activity-Based Costing

- Direct versus Indirect Costs
- ABC allocations take costs from one area/objective and allocates it to another area/objective.
- Allocations are based on activities that cause costs to be incurred – Cost Drivers. This requires a cost pool to accumulate costs and a cost base used to allocate.

Activity-Based Costing

- Three methods to allocate:
  1) Direct Distribution
  2) Step-down
  3) Multiple Distribution
Managerial Implications and Cautions

- Suppose the organization finds that it cannot reach the break-even volume, what can the managers do to preserve the service?
- Some cautions:
  - managers must rationally assess their ability to reach the break-even volume.
  - managers must be aware that prices and costs are not constant over time.

Capital Budgeting

- Capital Budgeting is a process used to evaluate investments in long-term or Capital Assets.
- Capital Assets:
  - have useful lives of more than one year;
  - analysis requires focus on the life of the asset;
  - low-cost, long-lived assets are not usually subjected to the Capital Budgeting process.
Capital Investment Analysis

- Four Principles for Capital Investment Analysis:
  - include all cash flows in the analysis,
  - adjust cash flows for the time value of money,
  - consider the riskiness of the investment and the cash flows in the analysis, and
  - rank the projects in accordance with the organization's goals.

Cost Benefit Analysis

- Compares the social costs and benefits of proposed programs or policy actions.

  Steps in Cost Benefit Analysis:
  - determine project goals.
  - estimate project benefits (in dollar terms).
  - estimate project costs.
  - discount the costs and benefits at an appropriate rate.
  - complete the analysis by comparing costs to benefits.

The Payback Method

- Used to select among investment alternatives that generate both cash inflows and cash outflows.

  The selection method calls for finding the alternative that returns the original investment to the organization in the shortest period of time.

  The method has two major shortcomings:
  - it ignores all cash flows after the break even is reached,
  - it ignores the time value of money.

  Since the break-even period is a rough measure of project risk, it can be useful as a tie breaker, especially if the discounted break-even method is used.
A Payback Method Example

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(1,000)</td>
<td>$(1,000)</td>
<td>$(1,000)</td>
<td>$(1,000)</td>
<td>(1,000)</td>
<td>$(1,000)</td>
</tr>
<tr>
<td>1</td>
<td>100</td>
<td>91</td>
<td>900</td>
<td>818</td>
<td>100</td>
<td>91</td>
</tr>
<tr>
<td>2</td>
<td>900</td>
<td>744</td>
<td>50</td>
<td>41</td>
<td>100</td>
<td>83</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>75</td>
<td>200</td>
<td>150</td>
<td>700</td>
<td>528</td>
</tr>
<tr>
<td>4</td>
<td>1000</td>
<td>1000</td>
<td></td>
<td></td>
<td>526</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>1000</td>
<td>150</td>
<td>10</td>
<td>900</td>
<td>382</td>
</tr>
</tbody>
</table>

Years to Payback: 2 never 3 3 4 4

A discount rate of 10% was used in above calculations.

Long-Term Financing

The Time Value of Money

The Time Value of Money says a dollar that you get at some point in the future is worth less than a dollar you get today.

Suppose the Museum of Technology is considering buying computers for a new special exhibit. The computers will cost $40,000 and will generate $10,000 in admissions revenues in each of the next four years. What should the museum's management do?

<table>
<thead>
<tr>
<th>Period</th>
<th>Period 0</th>
<th>Period 1</th>
<th>Period 2</th>
<th>Period 3</th>
<th>Period 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(40,000)</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
</tbody>
</table>
Simple and Compound Interest

- **Simple Interest** is the basis for all time value of money calculations. It is the interest that one earns in each period on the original amount of an investment.

- **Compound Interest** includes simple interest (the interest on the amount of the original investment) but it adds to that amount interest on all intervening interest payments.

- The calculation of compound interest requires that you know the interest rate being paid and the frequency of interest payments.

Compounding and Discounting

- **Compounding** finds the value at some point in the future of a dollar invested today at some specified rate of interest.

- **Discounting** is the reverse of Compounding. Discounting tells you what a dollar at some point in the future is worth today.

### Compound Interest Calculation

<table>
<thead>
<tr>
<th>Starting Principal (Present Value)</th>
<th>Compound Interest</th>
<th>Ending Compound Value (Future Value)</th>
<th>Ending Simple Interest Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100.00</td>
<td>1.12</td>
<td>$112.00</td>
<td>$112.00</td>
</tr>
<tr>
<td>$112.00</td>
<td>1.12</td>
<td>$125.44</td>
<td>$124.00</td>
</tr>
<tr>
<td>$125.44</td>
<td>1.12</td>
<td>$140.49</td>
<td>$136.00</td>
</tr>
<tr>
<td>$140.49</td>
<td>1.12</td>
<td>$157.35</td>
<td>$148.00</td>
</tr>
</tbody>
</table>

### Discounting

<table>
<thead>
<tr>
<th>Starting Principal (Present Value)</th>
<th>Discount</th>
<th>Ending Present Value (Present Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100.00</td>
<td>$100.00</td>
<td></td>
</tr>
<tr>
<td>$112.00</td>
<td>$90.66</td>
<td></td>
</tr>
<tr>
<td>$125.44</td>
<td>$80.26</td>
<td></td>
</tr>
<tr>
<td>$140.49</td>
<td>$72.58</td>
<td></td>
</tr>
</tbody>
</table>

The Power of Compounding

Suppose, in 1626, the Native American inhabitants of Manhattan Island had invested the $24 they received for the sale of Manhattan Island at 8% interest per annum. Here’s what they would have in 2010! (Current U.S. total GDP is roughly $15 trillion.)

<table>
<thead>
<tr>
<th>Simple Interest</th>
<th>Annual Compounding</th>
<th>Monthly Compounding</th>
</tr>
</thead>
<tbody>
<tr>
<td>($0.08 \times 384) \times $24 = $761</td>
<td>$164 trillion</td>
<td>$476 trillion</td>
</tr>
</tbody>
</table>
Present Value and Future Value

- Present Value is the value of an investment at its beginning point or any intermediary point before the end of the investment.

- Future Value is the compound value of any investment at any point after the beginning point.

FV = (1 + i)^n * PV

FV = (1 + .12)^4 * 100

FV = 112.00

PV = FV / (1 + i)^n

PV = 100.00 / (1 + .12)^4

PV = 100.00 / 1.12^4

PV = 100.00 / 1.5736

PV = 63.65

PV and FV Using the Calculator

- Four Factors in a Present Value or Future Value calculation:
  - PV: present value
  - FV: future value
  - i or r: interest rate per compounding period
  - N: number of compounding periods

- To find any of the four factors, enter the three factors that you do know and solve for the one that is missing.

- If interest is compounded more than once per year, the interest rate i and the number of compounding periods N must be adjusted accordingly!!!
**A Present Value Example**

Suppose someone offered to pay you $237,699 in forty years and you could invest your money at 8% with quarterly compounding. How much would that future payment be worth today?

- **PV = ?**
- **FV = $237,699**
- **i = 8% per annum / 4 quarters per annum = 2%**
- **N = 40 years * 4 compounding periods per year**

\[
PV = \frac{FV}{(1 + i)^N} = \frac{237,699}{(1 + 0.02)^{160}} = 10,000
\]

**The Time Line**

When analyzing complex Time Value of Money problems, it is often helpful to lay the cash flows out on a **time line**.

<table>
<thead>
<tr>
<th>period number</th>
<th>discount rate - adjusted for number of compounding periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2%</td>
</tr>
<tr>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>160</td>
<td>2%</td>
</tr>
</tbody>
</table>

- **PV**
- **$237,699**
- **Note:** outflows would be shown in parentheses.

**Solving for PV with the Calculator**

- Here are the steps:
  - Enter 237699 and press FV
  - Enter 2 and press i/Y or %i
  - Enter 160 and press N
  - Then press compute
  - Then press PV
  - 10,000.00 will appear on the calculator display.
Often capital investments generate more than one cash flow. In such cases, you can find the present value or the future value of those cash flows by calculating the PV or FV for each cash flow and adding them up.

Suppose that an investment in a new computer system was projected to generate savings of $3,000 in the first year, $5,000 the second year, and $7,000 in the third year. If the cost of funds for the organization is 10%, how much can the organization afford to spend on the system?

Solving for PV with Microsoft Excel

Use Function Wizard: Category: Financial Function: Present Value
Alternatively, Use Formula

\[
P V = \frac{F V (1 + r)^{-n}}{r}
\]

\[
P V = \frac{-227 \, 500 \, (1 + 0.02)^{-160}}{0.02}
\]

\[
P V = \frac{-227 \, 500 \, (1 + 0.02)^{-160}}{0.02} = -10,000.00
\]
An annuity is a special case of multiple cash flows:
- In an annuity all of the cash flows are equal and they are paid or received at evenly spaced time intervals. The time intervals do not have to be years! They can be days, weeks, months, quarters, etc.
- Examples of annuities:
  - Lottery payment of $250,000 per year for 20 years.
  - Car-loan payment of $299 per month for 48 months.
  - Five-year, $50 per month donor pledges to the Save the Children Federation.

Future Values and Present Values can be calculated for any annuity. Assume payments are made at the end of each period.
- The Future Value of an annuity is the amount that a stream of payments will be worth at the end of some period. For example, the future value of a stream of $2,000 deposits into an IRA for thirty-five years would be the amount that was available to pay for your retirement.
- The Present Value of an annuity is the value today of a stream of future payments. For example, the cost of a car financed with a five-year car loan or the amount that you would have to have in the bank today to have a retirement income of $5,000 per month for 20 years starting next month.
Annuities and the Calculator
Or Excel

- Like the single payment PV and FV calculations, there are four factors in annuity calculations:
  - PV: present value or FV: future value
  - PMT: the amount of the equal payment
  - i or r: the interest rate
  - N: the number of payments

- To find any of the four factors, enter the three factors that you do know and solve for the one that is missing.

- If interest is compounded more than once per year, the interest rate i and the number of compounding periods N must be adjusted accordingly.

A Future Value Annuity Example

- Suppose an individual were to put $2,000 at the end of each year into an IRA account for thirty-five years and earn an average of 12% per annum on that money. How much money would that person have available in the future for retirement?

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
<th>Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>1</td>
<td>($2,000)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>($2,000)</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>($2,000)</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>($2,000)</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>($2,000)</td>
<td></td>
</tr>
<tr>
<td>FV</td>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>

- You can get the answer by calculating the Future Value of each of the 35 cash flows separately and adding them up. That will always work. But you can do it more simply on the calculator.

- Here are the steps:
  - Enter 2000, then press +/-, then press PMT
  - Enter 12 and press I/Y or i%
  - Enter 35 and press N
  - Then press compute
  - Then press FV
  - $863,326.99 will appear on the calculator display.

Finding the Future Value

- What if you entered +2,000? What answer do you get?
Alternatively, Use Formula Directly

\[ FV = \frac{PMT \times [(1 + r)^n - 1]}{r} \]

where:
- \( FV \) is the future value.
- \( PMT \) is the payment amount.
- \( r \) is the interest rate per period.
- \( n \) is the number of periods.
Solving for the Payment

Suppose you now want to find out how much money you will have to live on each month during the thirty years of your retirement assuming you can earn 9%. Here is what you do and do not know to solve this problem:

- PV = $863,326.99
- PMT = ?
- i = 9% / 12 (note the adjustment for monthly payments)
- N = 30 * 12 (note the adjustment for monthly payments)

Use a calculator or computer spreadsheet to solve for PMT.

Excel: =PMT(rate, nper, pv, fv, type)

=PMT(9%/12,30*12,-863326.99)

=$6,946.52

Annuities in Advance

Suppose an individual were to sign a lease on an apartment requiring twelve monthly payments of $1,000 each. Payments are made at the beginning of each month. What is the present value of the lease? Assume a 12% discount rate.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td>($1,000)</td>
<td>($1,000)</td>
<td>($1,000)</td>
<td>($1,000)</td>
<td>$0</td>
</tr>
<tr>
<td>PV = ?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The present value of the first payment is simply $1,000. The present value of the remaining payments can be calculated as follows:

PMT = $1,000
N = 11 months
i = 1% per month

PV = ???? = 10,368

The total present value of the lease is:

$1,000 + $10,368 = $11,368

Or Using Excel: =PV(rate, nper, pmt, fv, type)

=PV(1%,12,-$1000, ,1)

=$11,368

Solution

The present value of the first payment is simply $1,000. The present value of the remaining payments can be calculated as follows:

PMT = $1,000
N = 11 months
i = 1% per month

PV = ???? = 10,368

The total present value of the lease is:

$1,000 + $10,368 = $11,368

Or Using Excel: =PV(rate, nper, pmt, fv, type)

=PV(1%,12,-$1000, ,1)

=$11,368
Mixed Cash Flows

It is not uncommon to find situations where the cash flows generated by capital investments result in combinations of annuities and unequal cash flows.

In these cases, you can use the annuity calculations to find the PVs or FVs of the annuities, use the single payment calculations for PVs or FVs of all other cash flows, and add them up.

A Mixed Cash Flow Example

What is the PV of the cash flows below?

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>500</td>
</tr>
<tr>
<td>3</td>
<td>500</td>
</tr>
<tr>
<td>4</td>
<td>2000</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Three year annuity of $500

Single Payment in Year Five

Note: Be careful!
This is not a 4-year annuity!

Finding the PV of the Mixed Cash Flows

1. First, find the PV of the three-year $500 annuity in year 1.
   - PV = ?, PMT = 500, i = 10%, N = 3
   - PV = $1,243.43 in year 1

2. Second, find the PV of that amount in year 0.
   - PV = ?, FV = $1,243.43, i = 10%, N = 1
   - PV = $1,130.39 in year 0

3. Third, find the period-0 PV of the single cash flow in year 5.
   - PV = ?, FV = 2,000, i = 10%, N = 5
   - PV = $1,241.84 in year 0

4. Add the two period-0 PVs.
   - Total PV = $1,130.39 + $1,241.84 = $2,372.23

Or do four separate calculations.
**The Net Present Cost Method**

- Used to evaluate alternative ways of meeting an organizational need.
- The present value of the costs of each alternative are calculated.
- The alternative with the lowest net present cost is selected.

**A Net Present Cost Example**

An urban planner working for Millbridge is considering buying a fleet of buses for the municipal transportation system. Either of two different buses would meet the town’s needs. Which one should they choose? Assume a 10% discount rate.

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase</td>
<td>$105,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Annual Outlay</td>
<td>$10,000</td>
<td>$20,000</td>
</tr>
<tr>
<td></td>
<td>$10,000</td>
<td>$20,000</td>
</tr>
<tr>
<td></td>
<td>$10,000</td>
<td>$20,000</td>
</tr>
<tr>
<td></td>
<td>$10,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Total</td>
<td>$155,000</td>
<td>$160,000</td>
</tr>
</tbody>
</table>

**Finding the Net Present Costs**

- PMT = 10,000
  - i = 10
  - PV = ?
- Find PV of $10,000 annuity at 10% interest for 5 years = $37,908.
- Add the purchase price of the Model A = $105,000
- The Net Present Cost is $142,908

- PMT = 20,000
  - i = 10
  - PV = ?
- Find PV of $20,000 annuity at 10% interest for 5 years = $75,816
- Add the purchase price of the Model B = $60,000
- The Net Present Cost is $135,816

Since Model B has the lowest Net Present Cost, it is the preferred alternative.
The Annualized Cost Method

- Used to evaluate alternative ways of meeting an organizational need when the useful lives of the equipment are different.
- First calculate the net present cost of each alternative.
- Then “annualize” that amount by finding the value of the annuity payment that is equal to the net present cost over the useful life of each piece of equipment.
- Select the alternative with the lowest annualized cost.

An Annualized Cost Example

Suppose that the two buses that the Millbridge planner is considering had different useful lives as shown below: Which model should be chosen?

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase</td>
<td>$105,000</td>
<td>$155,000</td>
</tr>
<tr>
<td>Annual Outlay</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>10,000</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$155,000</td>
<td>$140,000</td>
</tr>
</tbody>
</table>

Annualized Cost Calculations

- Find PV of $10,000 annuity at 10% interest for 5 years = $37,908
- Add the purchase price of the Model A = $105,000
- The Net Present Cost is $142,908
- Annualize the cost: PMT = ?, i = 10%, N = 5
  - $37,699
- Find PV of $20,000 annuity at 10% interest for 4 years = $63,397
- Add the purchase price of the Model B = $60,000
- The Net Present Cost is $123,397
- Annualize the cost: PMT = ?, i = 10%, N = 4
  - $38,928
- Select Model A. It has the lower Annualized Cost.
The Net Present Value Method

- NPV = PV of the Inflows - PV of the Outflows
- Used to evaluate capital investment alternatives that generate both cash inflows (revenues) and cash outflows (costs).
- Find the net cash flow in each year of the investment for each alternative by subtracting cash outflows from cash inflows. (Note: We do not use revenue and expense on an accrual basis for these calculations. Why?)
- Find the present value of the net cash flows generated by each investment.
- If the Net Present Value is greater than zero, make the investment. If choices have to be made, rank the investments in order of their net present values.

A Net Present Value Example

The Hospital for Ordinary Surgery is considering a new lab. The lab will cost $5 million and is expected to generate the cash flows shown below. If the hospital's cost of funds is 10%, should it undertake the project?

All numbers are in thousands.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash In</th>
<th>Cash Out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-5,000</td>
<td>0</td>
<td>-5,000</td>
</tr>
<tr>
<td>1</td>
<td>2,700</td>
<td>1,000</td>
<td>1,700</td>
</tr>
<tr>
<td>2</td>
<td>2,800</td>
<td>1,200</td>
<td>1,600</td>
</tr>
<tr>
<td>3</td>
<td>2,900</td>
<td>1,400</td>
<td>1,500</td>
</tr>
<tr>
<td>4</td>
<td>3,000</td>
<td>1,600</td>
<td>1,400</td>
</tr>
</tbody>
</table>

Present Value (Year 0): 1,545.5  1,239.7  1,127.0  956.2  -131.7

The hospital would not build the lab since the NPV is ($131,685).
Excel Solution: = NPV(rate,value 1, value 2) -5000
= NPV(10%, 1700, 1500, 1500, 1400) - 5000 = ($131.7)

Internal Rate of Return

- The Internal Rate of Return (IRR) method is an alternative way of looking at capital investments that generate both cash inflows and outflows.
- It tries to find out how much the organization earned on a percentage basis on its investment in the project.
- The internal rate of return is defined as the discount rate that sets the present value of the cash inflows generated by the investment equal to the cash outflows required to fund the investment.
- NPV = PV inflows - PV outflows
- NPV = 0 at discount rate
- Find rate at which this is true to find IRR.
Calculating the IRR

- If the cash inflows are an annuity, the IRR is the "i" in an annuity calculation. In the example below:

\[
\begin{array}{c|c|c|c}
\text{Period} & \text{Cash Inflow} & \text{Cash Outflow} \\
\hline
\text{Start} & \$3,250 & \$3,250 \\
\text{Period 1} & \$1,500 & \$1,500 \\
\text{Period 2} & \$1,500 & \$1,500 \\
\text{Period 3} & \$1,500 & \$1,500 \\
\end{array}
\]

\[PV = \$3,250, \quad PMT = \$1,500, \quad i = ?, \quad N = 3.\]

\[PV \text{ Outflow} = \$3,250\]
\[PV \text{ Inflow} = ? \text{ where PMT} = \$1,500, \text{ N} = 3, i = ?\]

\[PV \text{ Outflow} = PV \text{ Inflow at IRR}, \text{ so}\]
\[PV \text{ Inflow} = \$3,250, \text{ PMT} = \$1,500, \text{ N} = 3, i = \text{IRR} = ? = 18.2\%\]

Using Excel: =IRR(values, guess) = 18.2% per year

Limitations of the IRR

- IRR assumes that all cash flows are reinvested at the rate of return generated by the project.
- The IRR method may mis-rank mutually exclusive projects if they differ greatly in size.
- The method can produce multiple solutions for the IRR.
- If the cash flows are unequal, calculating an IRR is best left to the IRR function in a spreadsheet like Excel or Lotus 1-2-3.

Long-Term Financing

- Used to pay for capital assets when capital costs exceed the cash available from operations or it would not be prudent to use operating cash flow for capital purposes.
- **Equity** - additions to the permanent capital of an organization.
  - **Capital Campaign** - fundraising drives aimed at raising money to pay for long-lived assets.
- **Long-Term Debt** - borrowed money with a *maturity* of more than one year. Short-term debt refers to borrowed money that must be repaid within one year.
- **Leases** - contracts to make fixed payments in return for the right to use a capital asset.
**Types of Long-Term Debt**

- **Long-Term Notes** - unsecured loans.
- **Mortgages** - loans that are backed by a security interest in land and/or buildings that are owned by the borrower.
- **Bonds** - standardized loan agreements between borrowers and lenders.

**Liabilities**

- Liabilities are categorized as short term and long term depending on when they are due for payment.
- Short-term liabilities generally consist of:
  - specific "payables" which are typically due within thirty days,
  - wages or salary payable,
  - accounts payable,
  - short term notes payable – i.e., short-term loans, and
  - that portion of long-term debt which is due during the coming year.

**Liability Recognition**

- Liabilities are recognized when:
  - they are legally owed,
  - have to be paid, and
  - the amount to be paid can be measured objectively.

Which of the following should be recognized as a liability?
- a bill received from a vendor?
- wages that are due to a worker?
- a $5 million lawsuit filed against an organization?
Long-Term Liabilities

- Long-Term Liabilities are recorded at the Present Value of the required future payments. They include:
  - Long-Term Debt
  - Capital Leases
  - Long-Term Unsecured Loans, Long-Term Notes Payable
  - Mortgages
  - Bonds Payable
  - Pension Liabilities, and
  - Contingent Liabilities.

Amortizing Long-Term Debt

Suppose that Meals buys a delivery van for $32,000. It finances $25,000 of the purchase price with a five-year loan at 8% interest per annum. The loan calls for annual payments (in arrears) of $6,261.41. How much of each year’s payment would be interest? What would be the amounts shown on the Balance Sheet at the end of year 3?

<table>
<thead>
<tr>
<th>Year</th>
<th>Beginning Balance ($)</th>
<th>Total Payment ($)</th>
<th>Interest Portion ($)</th>
<th>Principal Portion ($)</th>
<th>Ending Balance ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25,000</td>
<td>6,261</td>
<td>2,000</td>
<td>4,261</td>
<td>20,739</td>
</tr>
<tr>
<td>2</td>
<td>20,739</td>
<td>6,261</td>
<td>1,659</td>
<td>4,602</td>
<td>16,136</td>
</tr>
<tr>
<td>3</td>
<td>16,136</td>
<td>6,261</td>
<td>1,291</td>
<td>4,971</td>
<td>11,166</td>
</tr>
<tr>
<td>4</td>
<td>11,166</td>
<td>6,261</td>
<td>893</td>
<td>5,368</td>
<td>5,798</td>
</tr>
<tr>
<td>5</td>
<td>5,798</td>
<td>6,261</td>
<td>464</td>
<td>5,798</td>
<td>0</td>
</tr>
</tbody>
</table>

End of Year 3 Bal. Sheet: Short-term Liability $5,368; Long-term Liability $5,798

How was the $6,261.41 calculated?

Calculating Mortgage Payments

Mortgages call for equal periodic payments which repay the amount borrowed and pay interest to the lender.

- At the beginning payments are mostly interest and near the end they are mostly principal. Mortgage payments are annuities.
- Assume a 30-year, $500,000, 12% per year mortgage with monthly payments:

\[
\begin{align*}
0 & \quad 359 & \quad 360 \\
1\% & \quad \uparrow & \quad \uparrow \\
\$500,000 & \quad PMT & \quad PMT & \quad PMT \\
\end{align*}
\]

\[N = 360, \ i = 1\% , \ PV = \$500,000, \ PMT = ?\]

Mortgage PMT = $5,143.06 per month
Bond Characteristics

- Bond agreements specify:
  - the amount to be repaid, called the \textit{par}, \textit{principal}, \textit{stated}, \textit{face}, or \textit{maturity value} of the bond;
  - the \textit{maturity date} when the money must be repaid;
  - the \textit{rate of interest}, called a \textit{coupon rate}, which will be paid on the face value of the bond; and,
  - the time intervals at which the interest must be paid, usually every six months.
- These factors are fixed for the life of the bond.

Bond Characteristics

- Bonds are used rather than simply borrow money from a lender for three primary reasons:
  - 1) Spread the Risk
  - 2) Disintermediate/Save Money
  - 3) Tax Treatment
- Revenue Bonds versus General Obligation – full faith and credit of the issuer.

Typical Bond Cash Flows

- Bonds are an example of mixed cash flows. Here is the time line for a ten-year, $1,000,000 face value bond that bears an interest rate of 10% per annum and pays interest every six months.
Valuing a Bond

- Normally, bonds can be sold by their owners. But, interest rates fluctuate on a daily basis.
- Since the cash flows from bonds are fixed, bond prices vary with changes in interest rates.
- Here's the general rule. Bonds are worth the present value of the stream of cash flows that they generate discounted at the prevailing market rate of interest.
- Suppose that we own a $1,000,000, 10%, 10-year semi-annual bond and want to sell it in a market where interest rates have risen to 12%. What will the bond be worth?

The Cash Flows Are Fixed!

0               1                         ...                            19                 20
6%
0 $50,000                   ...                      $50,000        $50,000
$1,000,000
Principal

The cash flows are unchanged! To value the bond we only change the interest rate used in the PV calculations to reflect the prevailing market rate!

The Calculations

First, calculate the PV of the $50,000 annuity using the 12% market interest rate.
N = 20, i = 6%, PMT = $50,000, PV = ?
PV = $573,496

Second, calculate the PV of the $1,000,000 repayment of principal.
N = 20, i = 6%, FV = $1,000,000, PV = ?
PV = $311,805

Then, add the two PVs to get the value of the bond.
Value of Bond = $573,496 + $311,805 = $885,301

Note: Excel and some calculators can do this as one calculation. Enter N, i, FV, and PMT. Solve for PV.
=PV(rate, nper, pmt, fv, type) =PV(6%,20,-50000,-100000)
Term Versus Serial Bonds

- Serial Bonds have a number of different maturity dates. This allows some of the principal to be paid back each year over a range of years, rather than all at once.
- Term bonds are all paid at one maturity date. However, amounts can be paid into a Sinking Fund at various times to accumulate money to repay principal at maturity.
- Call provisions are elements of the bond contract that allow the bond to be "called in" or repaid before the maturity date. Call provisions generally increase the interest rate on the bond when first issued, since it creates an advantage for the borrower.

Calculating Interest Rates for Serial Bonds - NIC

$10,000 serial bond, principal payments of $1,000 at the end of Years 1 and 2, $2,000 at the end of Year 3, and $3,000 at the end of Years 4 and 5. Interest rates are 3, 4, 5, 6, and 7% on the respective maturities, and the bond issue is initially sold at a $100 discount.

<table>
<thead>
<tr>
<th>Par or Principal</th>
<th>Coupon Rate</th>
<th>Years</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td>x 3%</td>
<td>x 1</td>
<td>$30</td>
</tr>
<tr>
<td>1,000</td>
<td>x 4%</td>
<td>x 2</td>
<td>80</td>
</tr>
<tr>
<td>2,000</td>
<td>x 5%</td>
<td>x 3</td>
<td>300</td>
</tr>
<tr>
<td>3,000</td>
<td>x 6%</td>
<td>x 4</td>
<td>720</td>
</tr>
<tr>
<td>3,000</td>
<td>x 7%</td>
<td>x 5</td>
<td>1,050</td>
</tr>
</tbody>
</table>

Interest Payments $2,180

Plus Discount 100

Total Interest $2,280

Calculating the NIC Interest Rate for Serial Bonds, continued

Calculate Bond Dollar Years

$10,000 x 1 = $10,000
9,000 x 1 = 9,000
8,000 x 1 = 8,000
6,000 x 1 = 6,000
3,000 x 1 = 3,000

Bond Year Dollars $36,000

Then the NIC is calculated as:

\[
NIC = \frac{\text{Total Interest} - \text{Premium + Discount}}{\text{Bond Dollar Years}} = \frac{2,280 - 100}{36,000} = 6.333\%
\]
Calculating the TIC Interest Rate for Serial Bonds

Par or Principal | Coupon Rate | Interest Paid at the End of
<table>
<thead>
<tr>
<th>$</th>
<th>%</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td>3%</td>
<td>$30</td>
<td>$30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$1,000</td>
<td>4%</td>
<td>$40</td>
<td>$40</td>
<td>$80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,000</td>
<td>5%</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,000</td>
<td>6%</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,000</td>
<td>7%</td>
<td>210</td>
<td>210</td>
<td>210</td>
<td>720</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interest Payment = $560 $530 $490 $390 $210 $2,180
Principal Payment = 1,000 1,000 2,000 3,000 3,000 10,000
Total Payment = $1,560 $1,530 $2,490 $3,390 $3,210 $12,180

Calculating the TIC Interest Rate, continued

Therefore, the TIC is the interest rate that makes:

$9,900 = (PV of $1,560, N=1) + (PV of $1,530, N=2) + (PV of $2,490, N=3) + (PV of $3,390, N=4)
+ (PV of $3,210, N=5)

Using a spreadsheet program such as Excel®, this can be solved using the IRR function. In Excel®, the solution formula would be:

= IRR(values, guess)
= 6.347%

Leases

- Types of leases:
  - Operating Leases: All short-term or cancelable leases
  - Capital Leases: Some long-term and non-cancelable leases

- Possible advantages of Leasing:
  - Flexibility and protection against obsolescence
  - Lower costs from pass-throughs of interest, equipment cost, and tax-related savings

- Possible disadvantages of leasing:
  - Tendency toward higher costs

- Capital lease obligations are valued at the PV of the remaining future lease payments
Managing Short-Term Resources and Obligations

Working Capital Management

- Working capital management focuses on making sure that the organization has the resources it needs to operate during the current year. It is a continuous process.
- Net Working Capital is defined as the resources that an organization can use to provide goods and services over the next year (Short-Term Assets) less what the amount that will have to be paid to other organizations and individuals over the coming year (Short-Term Liabilities).
  \[ \text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities} \]

- Net working capital is often compared to???

Short-Term Resources

- Liquid Resources
  - Cash for transactions, as a safety margin, and for investments.
  - Short-Term Investments to provide income from "idle" cash.
  - Managed by cash budgeting, cash management, and credit management (who to sell to on credit, whether to give a discount)
- Accounts Receivable - bills that have been sent out by the organization but have not yet been collected.
  - Managed through credit policies, collection efforts, and billing controls.
  - Aging Schedules are a valuable management tool.
- Inventory - supplies on hand for use in operations.
  - Managed with Periodic and Perpetual Control Systems.
### Sample Accounts Receivable Aging Schedule

Schedule shows $ and % of receivables by age and payer.

<table>
<thead>
<tr>
<th>Payer</th>
<th>1-30 Days</th>
<th>31-60 Days</th>
<th>61-90 Days</th>
<th>&gt;90 Days</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare</td>
<td>$4,400,000</td>
<td>$3,200,000</td>
<td>$2,000,000</td>
<td>$1,000,000</td>
<td>$10,600,000</td>
</tr>
<tr>
<td>Medicaid</td>
<td>3,800,000</td>
<td>2,400,000</td>
<td>1,500,000</td>
<td>1,250,000</td>
<td>8,950,000</td>
</tr>
<tr>
<td>HMO-1</td>
<td>2,300,000</td>
<td>1,300,000</td>
<td>600,000</td>
<td>450,000</td>
<td>5,550,000</td>
</tr>
<tr>
<td>Blue Cross/Blue Shield</td>
<td>3,500,000</td>
<td>800,000</td>
<td>400,000</td>
<td>0</td>
<td>4,700,000</td>
</tr>
<tr>
<td>Self-Pay Patients</td>
<td>3,500,000</td>
<td>1,000,000</td>
<td>750,000</td>
<td>1,500,000</td>
<td>6,250,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$16,200,000</strong></td>
<td><strong>$8,700,000</strong></td>
<td><strong>$5,450,000</strong></td>
<td><strong>$4,200,000</strong></td>
<td><strong>$34,550,000</strong></td>
</tr>
</tbody>
</table>

#### Amounts by Percent

<table>
<thead>
<tr>
<th>Payer</th>
<th>Medicare</th>
<th>Medicaid</th>
<th>HMO-1</th>
<th>Blue Cross/Blue Shield</th>
<th>Self-Pay Patients</th>
<th><strong>Total</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amounts by Percent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare</td>
<td>41.5%</td>
<td>42.5%</td>
<td>49.5%</td>
<td>74.5%</td>
<td>28.1%</td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>Medicaid</td>
<td></td>
<td>26.8%</td>
<td></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>HMO-1</td>
<td></td>
<td>25.7%</td>
<td></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>Blue Cross/Blue Shield</td>
<td></td>
<td></td>
<td></td>
<td>9.5%</td>
<td></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>Self-Pay Patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

---

### Current Liabilities

- **Short-term Payables** - amounts owed by the organization that have not yet been paid. Specific "payables" accounts can be set up for any general category of creditors.
  - Accounts Payable - generally used for goods and services.
  - Payroll Payables are for salaries and benefits due to employees.
  - Notes Payable and Interest Payable are for amounts due on loans.
  - Taxes Payable are for tax obligations that have not yet been paid.

---

### Calculating Short-Term Interest

Interest = loan amount (principal) x interest rate per year x fraction of a year

Suppose that an organization borrows $1,000,000 at an annual interest rate of 5.5% for a period of 45 days. How much interest will they have to pay?

\[
\text{Interest} = \$1,000,000 \times 0.055 \times \left(\frac{45}{365}\right) = \$6,780.82
\]
The Cash Budget

- How does working capital management impact on the elements of the cash budget?

**Beginning Cash Balance**
- + cash receipts
- Subtotal: Available Cash
- - cash payments
- Subtotal: Total Cash Payments
- Balance before borrowing, repaying or investing
- + borrowing or - repayments or investments

**Ending Cash Balance**

Inventory

- Inventory expenses represent the cost of using supplies to create goods or services. Inventory expenses and the ending inventory value are calculated using the following relationship:

\[ \text{Beginning Inventory} + \text{Purchases} - \text{Consumption} = \text{Ending} \]

- Tracking inventory use
  - Perpetual inventory
  - Periodic inventory

- LIFO and FIFO inventory flow assumptions
- Does the choice of FIFO or LIFO impact inventory expenses and ending inventory value? Why?
- Why would a not-for-profit organization want to use LIFO?
The Economic Order Quantity (EOQ)

- Goal is to minimize the overall costs related to ordering and holding inventory.
- The more you buy at one time, the greater the carrying or holding costs. These include capital and out-of-pocket costs.
  - Capital costs represent the cost of having paid for inventory instead of using that money for another purpose. Foregone interest on money paid for inventory is a measure of capital cost.
  - Out-of-pocket costs include storage space, insurance, taxes on inventory value, losses due to damage and other factors.

EOQ, continued

- The less you buy at one time, the more often you will have to place orders, and therefore the greater the total ordering costs for the year. These costs include the labor to place an order and the shipping costs.
- As the carrying costs go up due to fewer, large inventory orders, total ordering costs go down. As the ordering costs go up due to frequent, smaller orders, the carrying costs go down.
- EOQ calculates the optimal amount to order at one time.

EOQ, continued

- Total carrying costs (CC) for the year are equal to:
  \[
  CC = \frac{Q}{2} \times C
  \]
- Total ordering costs (OC) for the year are equal to:
  \[
  OC = \frac{N}{Q} \times O
  \]

Where C is the carrying cost per unit per year, Q is the amount of inventory in each order, O is the cost related to making one order, and N is the total amount of inventory ordered for one year.
EOQ, continued

The EOQ, or optimal amount to order at one time is calculated as follows:

\[ Q^* = \sqrt{\frac{2ON}{C}} \]

Where \( Q^* \) is the EOQ, \( O \) represents the costs related to making one order, \( N \) represents the total amount of inventory ordered for one year and \( C \) represents the carrying cost per unit per year.

Accountability and Control

“... we might hope to see the finances of the Union as clear and intelligible as a merchant’s books, so that every member of Congress and every man of any mind in the Union should be able to comprehend them, to investigate abuses, and consequently to control them ...”

Thomas Jefferson
Resource Library

- GAAFR; Implementation Guides
- Legislation that established the entity
- COSO and ERM Frameworks
- GFOA SEA Guidelines
- Your CGFO Textbooks
- USC Center for Governmental Services Book Series on Government, Funding and Budgets in South Carolina [3 Books]

Management Control Systems

- Sets of policies and procedures designed to keep operations going according to plan - detect variations and allow for corrective action:
  - Focus on responsibility accounting.
  - Combine monitoring, motivation, and incentives.
  - Require that performance be measured.
  - Need to focus on both viability (internal perspective) and effectiveness (external and internal perspective).

Primary Control - Timeliness

<table>
<thead>
<tr>
<th></th>
<th>Larger Governments</th>
<th>Smaller Governments</th>
<th>Information Rated “Very Useful”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 45 days</td>
<td>0.10%</td>
<td>1.10%</td>
<td>88%</td>
</tr>
<tr>
<td>Between 45 days and 3 months</td>
<td>4.00%</td>
<td>9.80%</td>
<td>43%</td>
</tr>
<tr>
<td>Within 3 months and 6 months</td>
<td>73.30%</td>
<td>45.50%</td>
<td>9%</td>
</tr>
<tr>
<td>Within 6 months and one year</td>
<td>20.70%</td>
<td>36.20%</td>
<td>1%</td>
</tr>
<tr>
<td>Beyond 1 year</td>
<td>1.90%</td>
<td>7.40%</td>
<td>1%</td>
</tr>
</tbody>
</table>

SOURCE: GAAFR REVIEW APRIL 2011
The Internal Control System

- Internal Control Systems - focus on efficient and effective use of resources and on the protection of the organization's resources.
- Contain before-the-fact Accounting Controls and after-the-fact Administrative Controls.
- The controls are coordinated to minimize avoidable losses, and
- Are designed in a cost effective way.

Elements of a Control System

- Audit Trail
- Reliable Personnel
- Separation of Functions
- Proper Authorization
- Adequate Documentation
- Proper Procedures
- Physical Safeguards
- Bonding, Vacations, and Rotation of Duties
- Independent Check

Management Control Systems - maximize compliance with the organization's plans.
Internal Control Systems - protect and use resources efficiently and effectively.

Balanced Scorecard

Financial measures are just one part of a larger set of measures that are needed to assess organizational performance and control its operations.

Balanced Scorecard Elements – develop key performance indicators (KPIs) for the
- Financial perspective.
- Customer perspective.
- Internal business perspective.
- Learning and growth perspective.

Balanced Scorecard Benefits – forced to consider a broad view of the critical factors for success, define KPIs to measure performance, and collect data that can track how the organization is doing in all of these areas.
Triple Bottom Line

- Organizations should be concerned about and measure:
  - financial performance beyond the organization,
  - environmental performance - the impact of its actions throughout the life cycle of its products and services, and
  - social performance - consider the interdependencies between the organization and individuals and society as a whole.

Quality Control

- Cost of Quality Report:
  - Prevention costs,
  - Appraisal costs,
  - Internal failure costs, and
  - External failure costs.

- Total Quality Management

- Six Sigma

Variance Analysis

- Variance analysis investigates differences (variances) between planned and actual results. It helps managers:
  - prepare budgets for the coming year,
  - control results in the current year, and
  - evaluate the performance of operating units.

- Variance analysis focuses on material differences to help managers correct problems and capitalize on opportunities.
Some Variance Terms

- Variance analyses can be prepared for costs, revenues, and profits/(losses).
  - Lower than expected costs or higher than expected revenues or profits result in favorable variances. Favorable variances are designated with a capital “F.”
  - Higher than expected costs or lower than expected revenues or profits result in unfavorable variances. Unfavorable variances are designated with a capital “U.”

Some organizations treat favorable variances as positive numbers, and some treat them as negative numbers. The same is true for unfavorable variances.

Variance Mechanics

- The budgeted and actual costs and the resulting month and Y-T-D variances for the Hospital for Ordinary Surgery illustrate an unfavorable cost variance.

<table>
<thead>
<tr>
<th>Month</th>
<th>Actual</th>
<th>Budget</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Month</td>
<td>$9,200,000</td>
<td>$8,800,000</td>
<td>$400,000 U</td>
</tr>
<tr>
<td>This Year</td>
<td>$25,476,000</td>
<td>$25,150,000</td>
<td>$326,000 U</td>
</tr>
</tbody>
</table>

Department and Line Item Variances

- Variances at most levels of an organization represent aggregations of variances from other levels. For example: total organizational expense variances represent the sum of departmental variances, while departmental variances are made up of line item variances.

<table>
<thead>
<tr>
<th>Department</th>
<th>Actual</th>
<th>Budget</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>$400,000</td>
<td>$395,000</td>
<td>$5,000 U</td>
</tr>
<tr>
<td>Supplies</td>
<td>$400,000</td>
<td>$205,000</td>
<td>$195,000 U</td>
</tr>
<tr>
<td>Total</td>
<td>$800,000</td>
<td>$600,000</td>
<td>$200,000 U</td>
</tr>
</tbody>
</table>

Suppose the supply variance was $50,000 F and the salary variance was $50,000 U. What would the total variance be? Should it be investigated?
Flexible Budget Variance Analysis

Flexible Variance Analysis allows managers to identify what portion of a total variance is due to:

- differences between the budgeted and actual volume of some output (Volume Variance),
- differences between the budgeted and actual price (or rate) of each unit of input or output (Price or Rate Variance), and
- differences between the budgeted and actual quantities of the resources used per unit of output (Quantity or Use Variance).

Volume, Price, and Quantity Examples

<table>
<thead>
<tr>
<th>School Cost Example</th>
<th>Hospital Revenue Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost of Textbooks</td>
<td>Total Oncology Patient Revenue</td>
</tr>
<tr>
<td>Volume</td>
<td>Number of third grade students</td>
</tr>
<tr>
<td>Quantity</td>
<td>Number of textbooks per third grade student</td>
</tr>
<tr>
<td>Price</td>
<td>Cost per textbook for third grade students</td>
</tr>
</tbody>
</table>

Variance Analysis Cautions

- **Aggregation** can hide meaningful variances and lead managers to misinterpret the condition of the organization.
- **Exception Reports** should be prepared for all material variances that warrant management's attention.
- **Fixed costs** should not result in volume variances, since they are not expected to change with volume.
- Expense and Revenue variances often have to be analyzed together. For example, an unfavorable expense volume variance may be good for the organization if it is accompanied by an even larger favorable revenue volume variance.
## Discussion Questions

- Why do professional organizations frequently have a written Code of Ethics?
- Find and read the Code of Ethics for your professional association that you are or will be affiliated with upon graduation. E.g., The American Institute of Certified Public Accountants.

## Managerial and Financial Accounting

- Managerial Accounting: Internal Focus.
  - Plan
  - Implement
  - Control
- Financial Accounting: External Focus.
  - Record events or transactions.
  - Report financial position and results of operations.

## Financial Statement Concepts

- **Generally Accepted Accounting Principles** *from the FASB (not-for-profits and health care) or the GASB (governments) guide the preparation of financial statements.*
- **Entity Concept** *requires that you define the organizational component for which you are trying to account.*
- **Money Denominator Convention** *requires that all items included on the financial statements be measurable in dollar terms.*
- **Objective Evidence** *(objectivity or reliability principle)* and the **Cost Convention** *(cost principle)* require that values be based on an objective valuation of resources. When there is a dispute over value, cost is used.
More Financial Statement Concepts

- **Conservatism**: says that you should anticipate losses but not gains.

- **Going Concern Concept**: assumes that the organization will continue in operation. Bankruptcy values may be lower.

- **Materiality**: says that reporting only needs to contain the level of detail and accuracy necessary for decision making. Financial reports do not need to be exactly accurate.

- **Accrual Concept**: states that revenues are recorded when the organization has earned them and expenses are recorded when resources are used to generate revenues.

ASSERTIONS

**CATEGORY**  
Account Balances at period end

**ASSERTION**  
- Existence
- Rights and Obligations
- Completeness
- Valuation and Allocation

**CATEGORY**  
Classes of Transactions/events during the period

**ASSERTION**  
- Occurrence
- Completeness
- Accuracy
- Cutoff
- Classification
<table>
<thead>
<tr>
<th>ASSERTIONS</th>
<th>ASSERTION</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurrence</td>
<td>Rights and Obligations</td>
<td>Presentation and Disclosure</td>
</tr>
<tr>
<td>Completeness</td>
<td>Classification and Understandability</td>
<td></td>
</tr>
<tr>
<td>Accuracy and Valuation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How to Use Excel in Time Value of Money

Excel and TVM: Present Value
Excel and TVM: IRR