

# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 1: Finance Principles and Processes**

# Finance Principles and Processes

## *Topics Overview*

- *Objectives of Financial Management*
- *Corporate Finance Activities*
- *Basic Corporate Financial Concepts*
- *Working Capital Management*
- *Financial Investment Decisions*

# Discussion Question

What is the primary objective of financial management and what are some strategies to meet that objective?



**Answer:**

**Objective:** Efficient use of resources to maximize shareholder wealth.

**Strategies:**

- Maximize present value of future cash flows
- Maximize return on shareholders' investment

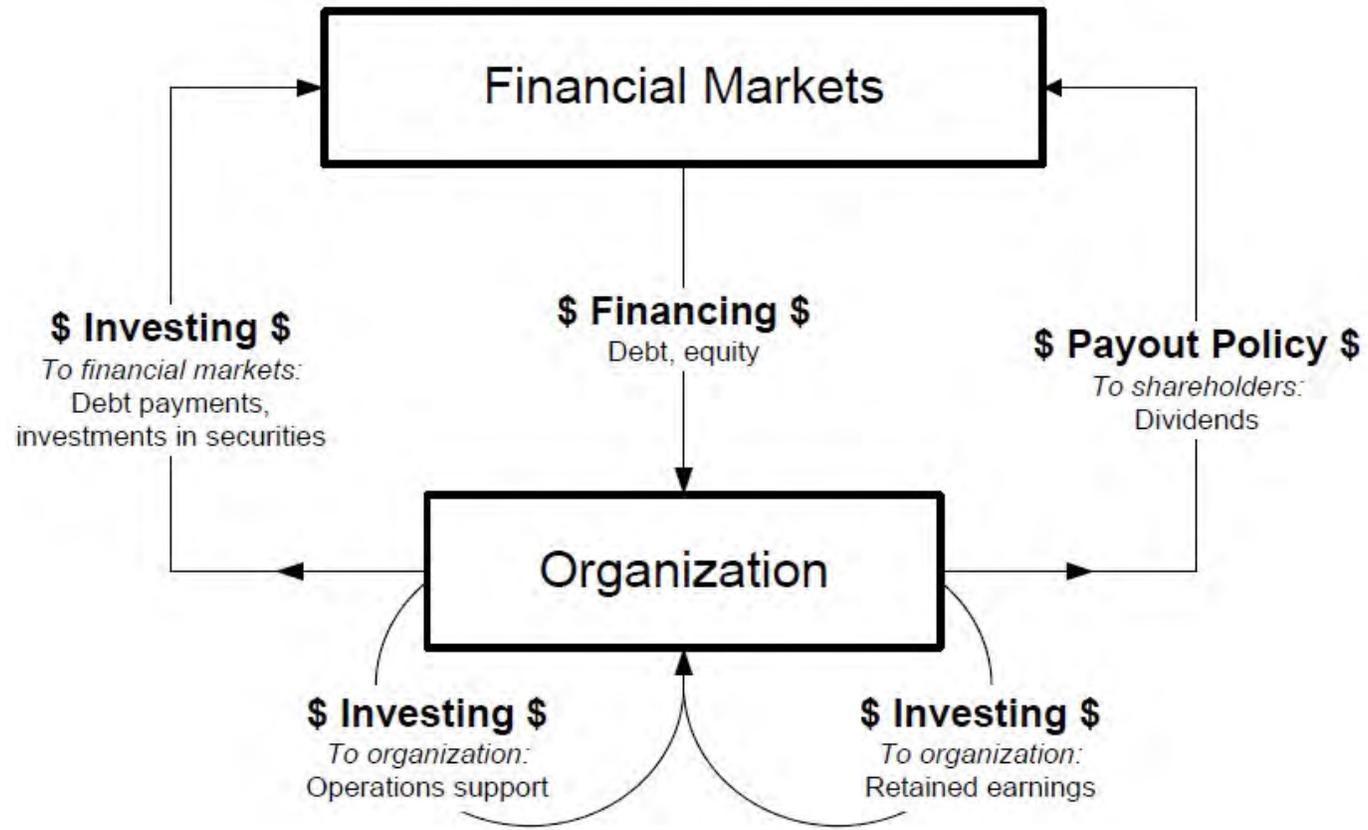
# Maximizing Shareholder Wealth

FP&A helps managers collect, analyze and understand financial data to decide how to:

- Increase cash flow
- Speed up cash flow
- Reduce cash flow risk
- Make investment decisions
- Make financing decisions
- Operate assets efficiently



# Corporate Finance Activities



# Discussion Question

What is the FP&A professional's role in investing decisions?



**Answer:**

- Budgeting and forecasting to assess short- and long-term funding needs
- Scenario analysis for investing decisions

# Time Value of Money



# Future Value and Present Value

## Future Value (FV)

$$FV = PV(1 + i)^n$$

Where:

FV = Future value

PV = Present value or value today

i = Periodic (annual) interest rate

n = Number of periods (years)

## Present Value (PV)

$$PV = FV \left[ \frac{1}{(1 + i)^n} \right]$$

# Calculating PV in a Worksheet

Present Value with Simple Interest

Present Value with Compounding

Present Value of an Annuity

Present Value of a Constantly Growing Annuity

*Function syntax:*

```
=PV(rate,nper,pmt,[fv],[type])
```

	A	B	B
1	<b>Future Value</b>	\$4,942.34	4942.34
2	<b>Annual Interest Rate</b>	10.50%	0.105
3	<b>Investment Term in Years</b>	5	5
4			
5	<b>Present Value at Beginning of Term</b>	\$3,000.00	=PV(B2, B3, 0, -B1)
6	<b>Total Interest Paid</b>	\$1,942.34	=B1-B5

# Financial Valuation Methods

## Discounted Cash Flow (DCF)

Discounts the future value of all cash inflows and outflows of an investment back to their present value by factoring in costs of capital—debt and equity costs.

## Required Rate of Return (RRR)

The minimum annual percentage earned on invested capital for it to be deemed acceptable. Equal to the weighted average cost of capital (WACC).

# Net Present Value (NPV)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
1. Identify cash flows.	\$(75,000)	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000
2. Calculate present values.	\$(75,000)	$18,000 \div 1.1 =$ \$16,364	$18,000 \div 1.21 =$ \$14,876	$18,000 \div 1.33 =$ \$13,534	$18,000 \div 1.46 =$ \$12,329	$18,000 \div 1.61 =$ \$11,180
3. Add values.	\$(75,000)	\$68,283				
	\$(6,717)					

*Function syntax:*

=NPV(rate,Value1,[Value2],[Value3])+Initial Investment

# Internal Rate of Return (IRR)

*Internal rate of return (IRR)* is the discount rate at which the net present value of an investment becomes zero.

A project is acceptable only if the IRR exceeds the organization's target rate of return or weighted average cost of capital (WACC).

# Opportunity Cost

Invest \$700

FIRM A

PV of returns = \$1,000

VS.

FIRM B

PV of returns = \$1,250

Which is the better investment?

# Cost of Capital

Capital	Capital Structure	Rate of Return	Weighted Cost of Capital
Debt	40%	7%	2.8%
Equity	60%	5%	3.0%
			5.8%

# Dividend Payout Policy Considerations

- There is still excess cash flow after considering all potential, positive net present value investments.
- The positive cash flow is expected to continue.
- Debt levels are reasonable.
- There is a sufficient cash cushion available.



# Discussion Question

What is the FP&A professional's role in payout decisions?



**Answer:**

**Providing analysis on:**

- Investment opportunities
- Cash surpluses
- Advisable cash cushions
- Investor/analyst expectations
- Industry/competitor payout ratios
- Capital structure

# The Role of the Treasury Function

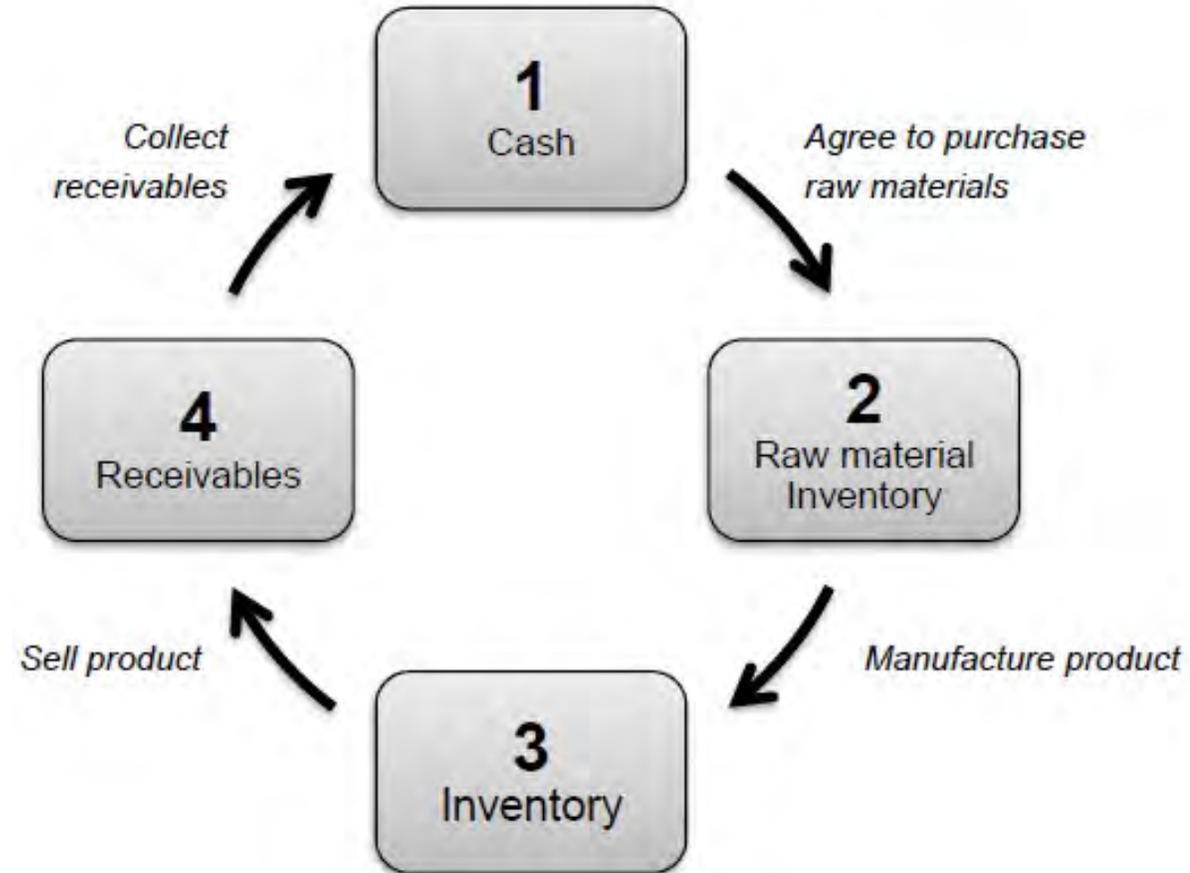
## Short Term

- Maintain Liquidity
- Optimize Cash Resources
- Maintain Access to Short-Term Financing
  - Credit Lines
  - Commercial Paper
  - Factoring
- Manage Short-Term Investments

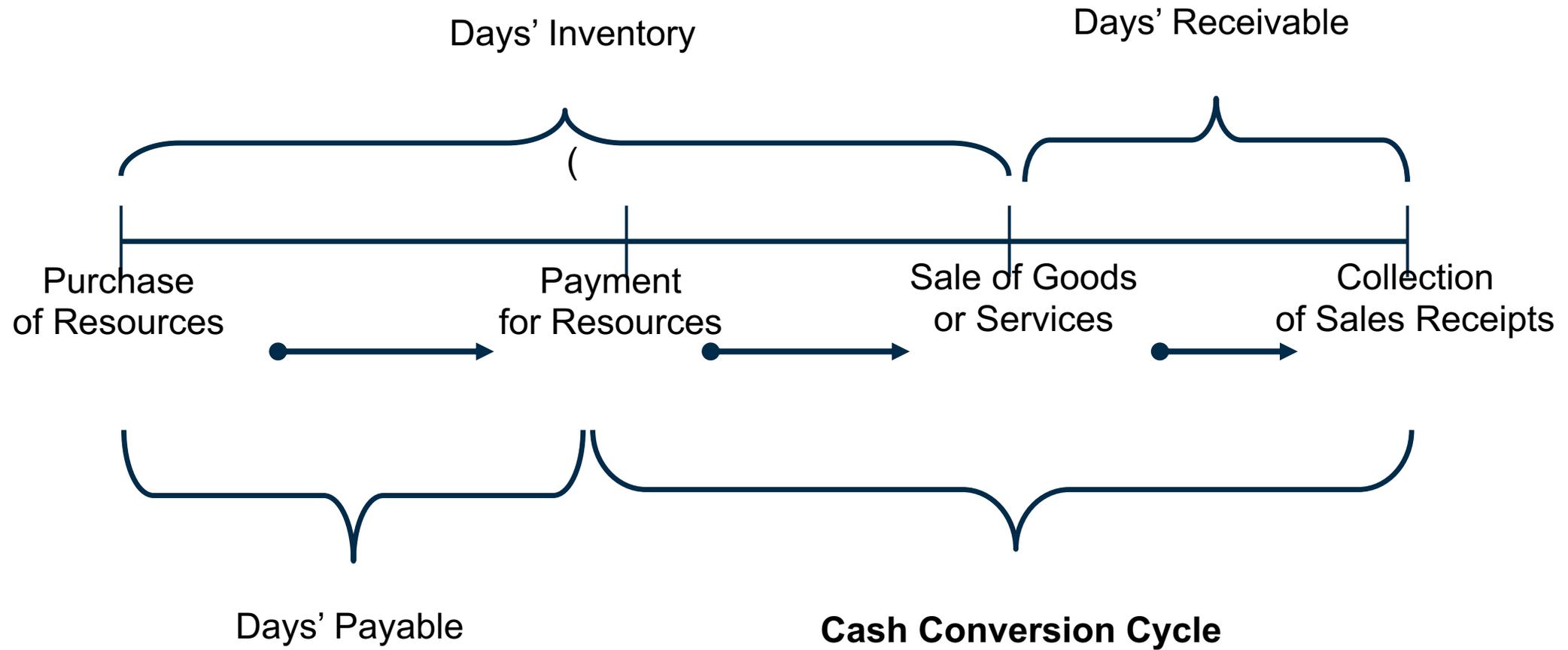
## Long Term

- Maintain Access to Medium and Long-term Financing
  - Bank loans
  - Bonds
  - Long-Term Leases
  - Equity Issuance
- Risk Management

# Operating Cycle



# Cash Conversion Cycle



# Components of the Cash Conversion Cycle

$$\text{Days' Inventory Outstanding (DIO)} = \left( \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} \right) \times 365$$

$$\text{Days' Sales Outstanding (DSO)} = \left( \frac{\text{Average Accounts Receivable}}{\text{Revenue}} \right) \times 365$$

$$\text{Days' Payable Outstanding (DPO)} = \left( \frac{\text{Average Accounts Payable}}{\text{Cost of Goods Sold}} \right) \times 365$$

$$\text{CCC} = \text{DIO} + \text{DSO} - \text{DPO}$$

# Benefits of Reducing the Cash Conversion Cycle

- Increased Operating Cash Flow
- Improved Liquidity
- Reduced Borrowings
  - Decreased Interest Expense
  - Improved Financial Flexibility

# Current Asset Financing Strategies

<b>ASSET BREAKDOWN</b>	<b>FIXED ASSETS</b>	<b>PERMANENT CURRENT ASSETS</b>	<b>FLUCTUATING CURRENT ASSETS</b>
<b>MATURITY-MATCHING STRATEGY</b>	<b>LONG-TERM SOURCES</b>		<b>SHORT-TERM SOURCES</b>
<b>CONSERVATIVE STRATEGY</b>	<b>LONG-TERM SOURCES</b>		<b>SHORT-TERM SOURCES</b>
<b>AGGRESSIVE STRATEGY</b>	<b>LONG-TERM SOURCES</b>	<b>SHORT-TERM SOURCES</b>	

# Capital Investments

Types:

- PPE
- Expansion

Does the capital investment align with the strategic plan?

“Go” or “No-Go”?

- NPV

# NPV Principle

**NPV = Present Value of Cash Inflows – Present Value of Cash Outflows**

- If NPV > \$0, then “Go”
- If NPV < \$0, then “No-Go”
  
- Only incremental cash flows
  
- Discounting captures opportunity costs

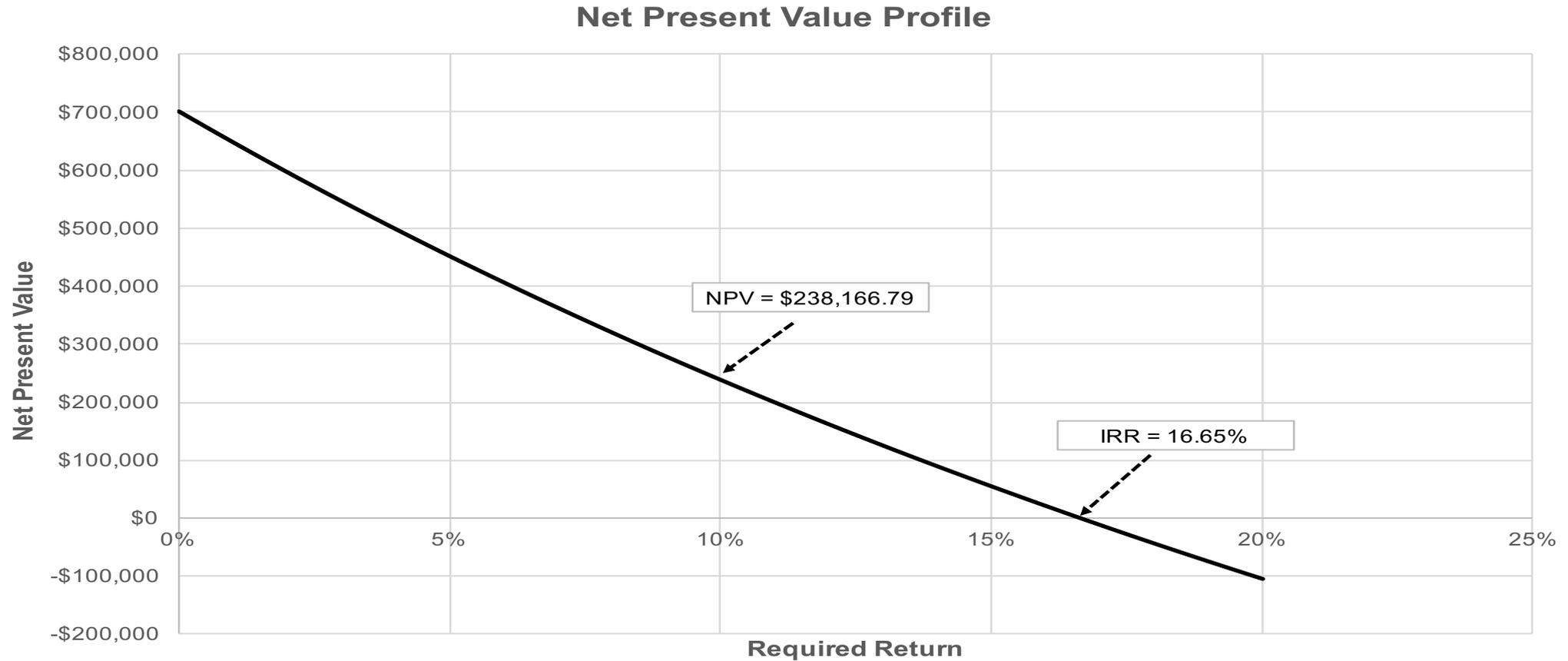
# Pro-Forma After-Tax Cash Flows

Revenues
Less: Cash Expenses
Less: Depreciation Expense
Earnings Before Interest and Taxes
Less: Taxes
Earnings After Tax
Plus: Depreciation Expense
After-Tax Cash Flow

# Re-Evaluating Key Assumptions with Sensitivity Analysis

- Variables Used to Project After-Tax Cash Flows
- Required Return

# How Sensitive is the NPV to a Change in the Required Return?



# Re-Evaluating Key Assumptions with Scenario Analysis

- Worst-Case
- Base-Case
- Best-Case

# Financial Investment Decisions: Lease Versus-Buy Analysis

- Leasing provides flexibility and a lower upfront capital commitment
- Process for optimizing the decision: Net Advantage of Leasing
  - Applied NPV principle

# Financial Investment Decisions: M&As and Divestitures

- Whether another unit/firm should be acquired and/or whether a current area of the firm should be sold depends on the marginal benefits versus the marginal costs
  - Applied NPV principle

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# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 2: Strategy**

# Strategy

## *Topics Overview*

- *Nature of Strategy*
- *Strategic Planning Framework*
- *Strategy and Measurement*
- *Risk*

# Strategy Defined

## Strategy

How an organization positions itself relative to its competition, deploys its resources and directs its activities to create and sustain its competitive edge.

# Sustainable Strategy Considerations

An organization must consider:

The organization's capabilities and culture

Industry forces

External or macroenvironment

# Functions of Strategy



# Strategic Planning Framework



# 1. Internal and External Analysis

It is essential for strategic planners to know:

Whether the organization has the structure and resources needed to achieve its strategic goals

Where the organization will compete

What external factors can influence the outcome



# SWOT Analysis



## 2. Goal Setting Purposes

Goals are influenced by 3 primary levers of value:

1. Earnings
2. Efficient use of assets
3. Ratio of equity to debt

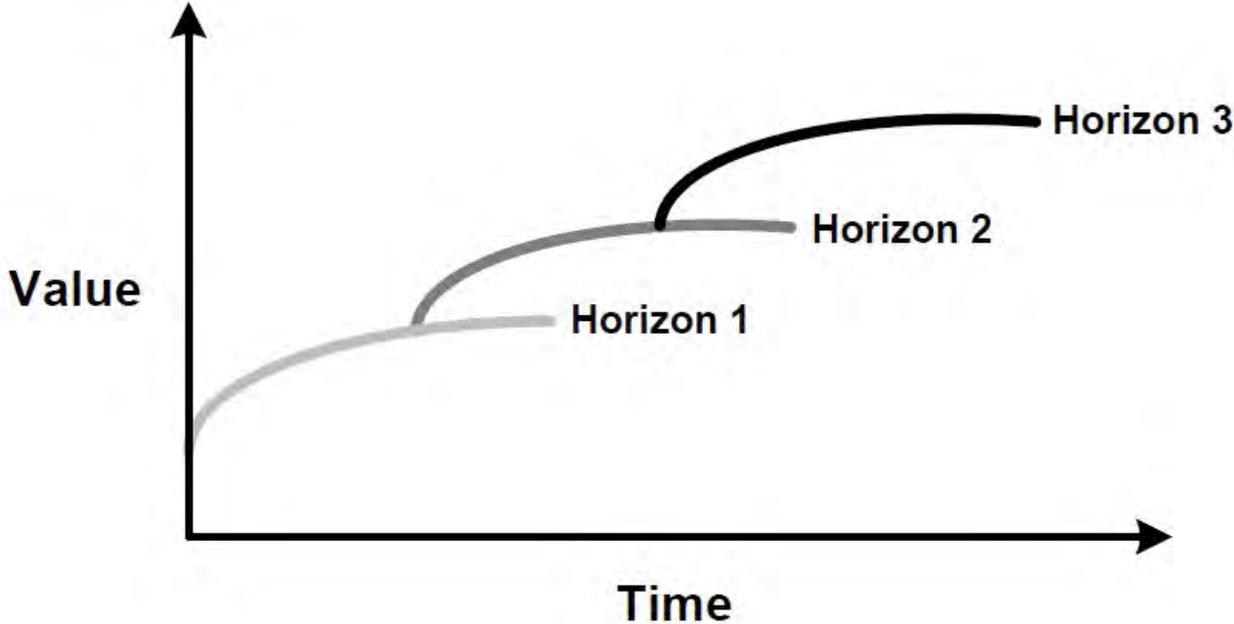
### Strategic goals

- Satisfy reporting requirements
- Encourage progress
- Signal external stakeholders and motivate internal stakeholders
- Provide a rational and systematic basis for organizational activity
- Measure progress

# 3. Strategic Development



# Three Horizons of Growth



# 4. Plan Development

FP&A may:

Conduct its own SWOT analysis.

Set its own goals and targets for the period.

Implement its own strategic initiatives

Allocate budget to strategic priorities

Establish a process for reviewing the function's performance and reporting to management.



# 5. Resource Allocation

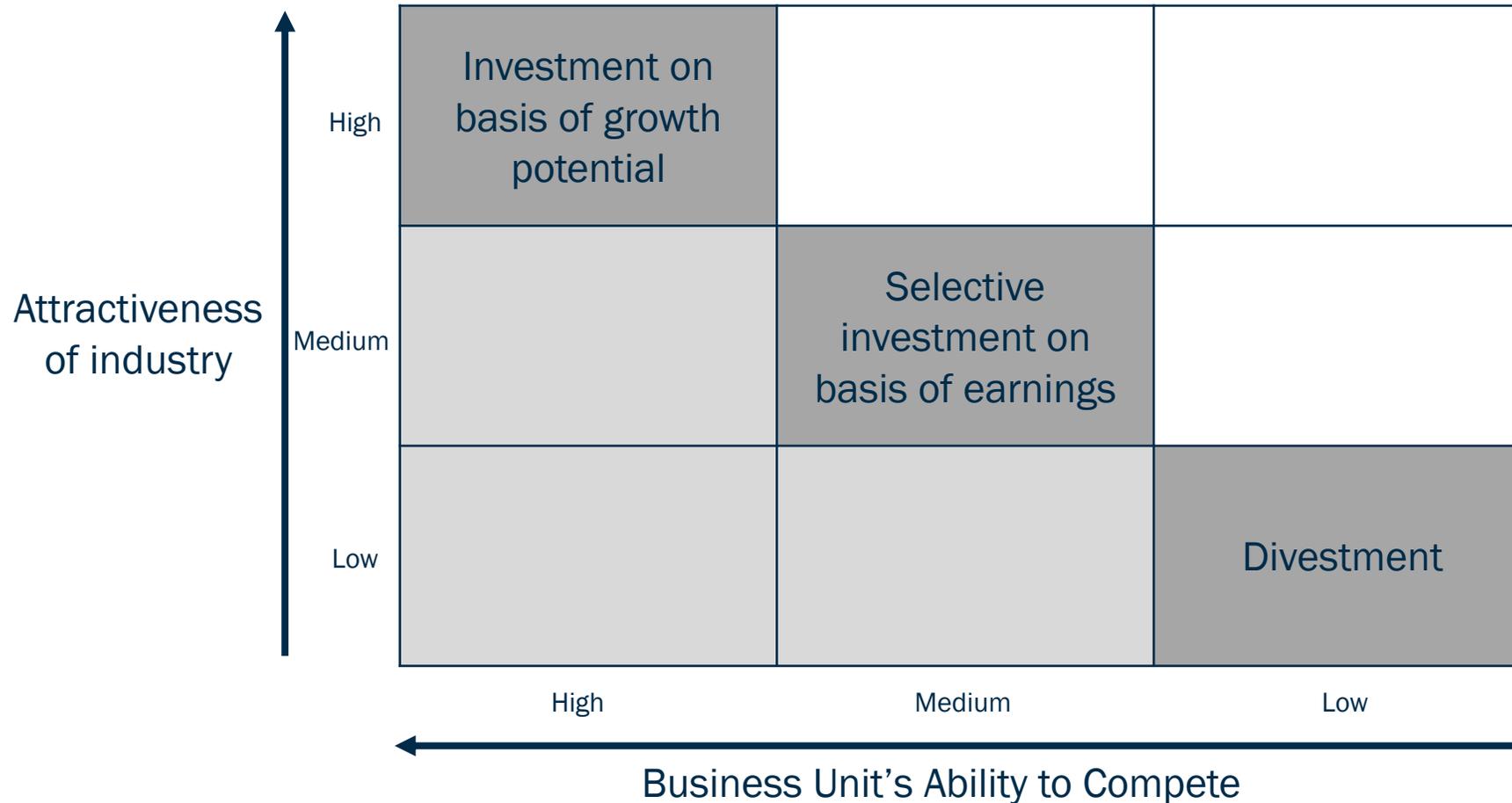
An organization must consider each activity receiving resources and each allocation decision in terms of its contribution to the organization's economic value and its relation to its strategic vision.



# BCG Growth-Share Matrix



# McKinsey Nine-Box Matrix



# 6. Measurement

Regular measurement of progress in achieving strategic goals:

Motivates the organization

Assures investors and lenders

Provides an early warning when a strategy is not working



# Value Drivers

Banking	Energy	Retail	University
<ul style="list-style-type: none"> <li>• Customer retention</li> <li>• Customer penetration</li> <li>• Fees generation</li> <li>• Asset quality</li> <li>• Capital adequacy</li> <li>• Assets under management</li> <li>• Loan losses</li> </ul>	<ul style="list-style-type: none"> <li>• Capital expenditure</li> <li>• Exploration success rate</li> <li>• Refinery capacity</li> <li>• Efficiency of refinery use</li> <li>• Proven reserves</li> <li>• Costs of developing reserves</li> </ul>	<ul style="list-style-type: none"> <li>• Capital expenditures</li> <li>• Store redesign</li> <li>• New stores</li> <li>• Attraction of new shoppers</li> <li>• Store sales</li> <li>• Efficiency in generating sales per unit of retail space</li> <li>• Customer satisfaction</li> <li>• Use of sustainable policy guidelines in purchasing</li> </ul>	<ul style="list-style-type: none"> <li>• Tuition payments</li> <li>• Ability to attract endowments and grants</li> <li>• Operating costs of properties</li> <li>• Patents granted</li> <li>• Community satisfaction</li> </ul>

# Balanced Scorecard



# Definition of Risk

## Risk

*ISO defines risk as*  
“the effect of uncertainty on objectives.”

- Its impact can be perceived as quantitative and qualitative.
- Effects may be short-term or long-term.

# Benefits of Risk Management

Implementing risk management processes helps ensure that the organization deals with risk in a rational and cost-effective manner.

Organizations that actively manage risk are

- usually more efficient, profitable and transparent.
- more likely to maintain compliance with laws and regulations.
- more likely to secure capital.



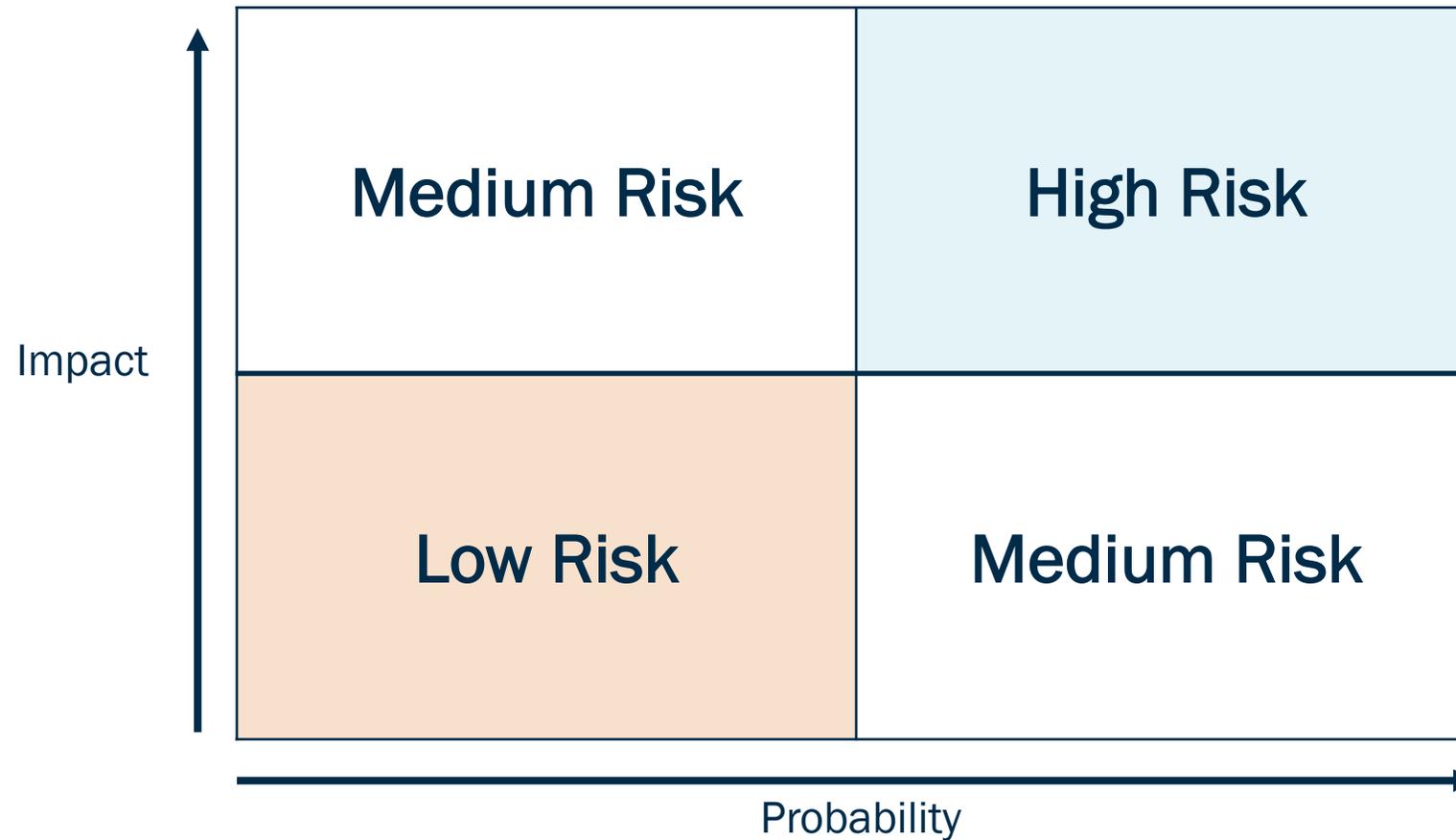
# Risk Management Process



# Classifying Risks



# Risk Matrix



# Quantitative Risk Analysis

Expected Value = Probability x Impact

# Risk Treatment

Accept the risk without further action

Avoid entirely

Mitigate (prevent occurrence and/or lessen impact)

Transfer or share risk

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Part 1

Domain A: Concepts of Business and  
Finance

Chapter 2: Strategy

# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 3: Financial Accounting and Reporting**

# Financial Accounting and Reporting

## *Topics Overview*

- *Accounting Concepts and Standards*
- *Accounting and External Financial Reporting*
- *Income Statement*
- *Balance Sheet*
- *Statement of Cashflows*
- *Interactions Among Common Financial Statements*

# Key Accounting Concepts and Standards

## Elements

- Assets
- Liabilities
- Equity
- Revenues
- Expenses

Accounts refer to the records within each element.

# Accounting Standards

## Global Accounting Standards

- International Financial Reporting Standards (IFRS) as pronounced by the International Accounting Standards Board (IASB)

## U.S. Accounting Standards

- Generally Accepted Accounting Principles (GAAP) as pronounced by the Financial Accounting Standards Board (FASB)

*IFRS is focused more on principles, while GAAP is more rules based.*

# Accrual Accounting

Used by GAAP and IFRS

**Provides management with some latitude.**

- Earnings management versus earnings manipulation

# Areas of Financial Reporting Support Provided by FP&A

Accounting cycle

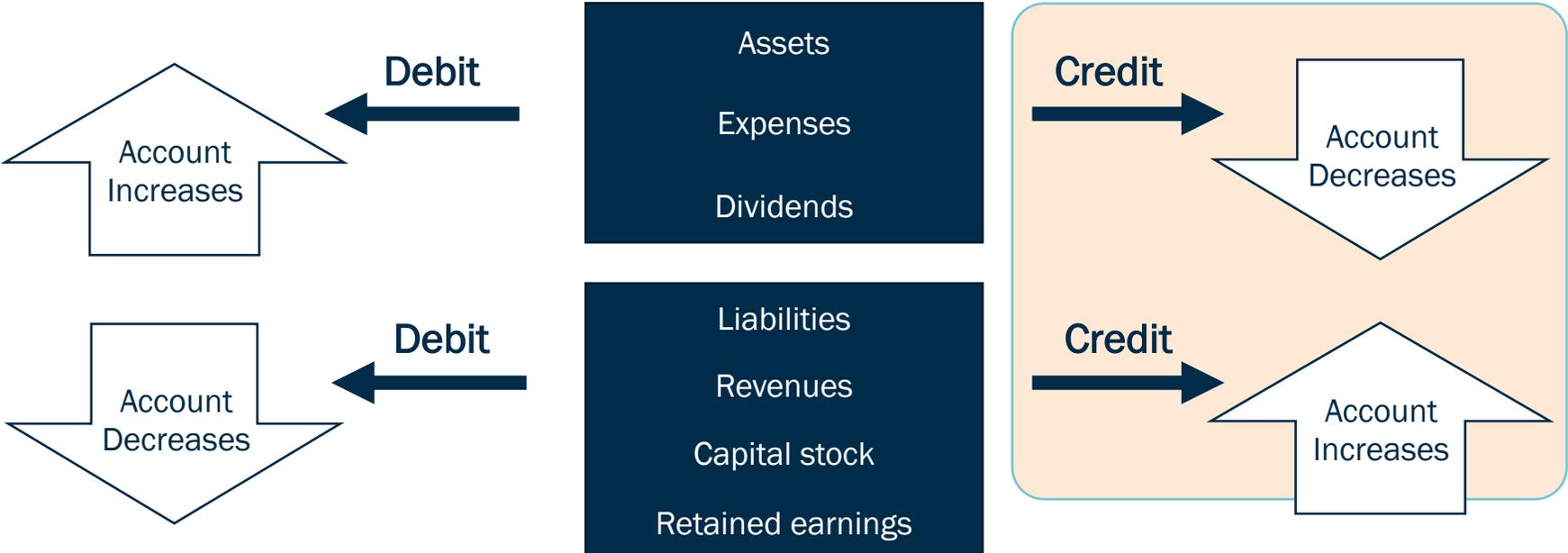
Journal entries

Financial reporting analysis

Critical financial issues and potential transactions

Profitability reporting

# Journal Entries



# Journal Entry Example

Suppose a firm borrows \$1,000 from a line of credit at the bank.

- Cash (an asset account) is increased. This results in a **debit** to cash for \$1,000.
- Notes payable (a liability account) is increased. This results in a **credit** to notes payable of \$1,000.
- Net effect: Both sides of the balance sheet are increased.

# The Income Statement

	A	D	E	F
1	<b>Income Statement</b>			
2	<b>ShopNow!</b>			
3	<i>(Millions)</i>			
4	For the years ended December 31,			
7		2011	2012	2013
8	Revenue	\$33,669	\$46,227	\$56,206
9	Cost of Goods Sold	21,673	32,647	36,161
10	<b>Gross Profit</b>	<b>\$11,996</b>	<b>\$13,580</b>	<b>\$20,045</b>
11	SG&A	7,320	9,847	13,694
12	<b>EBITDA</b>	<b>\$4,676</b>	<b>\$3,733</b>	<b>\$6,351</b>
13	Depreciation & Amortization	870	1,207	1,510
14	<b>EBIT</b>	<b>\$3,806</b>	<b>\$2,526</b>	<b>\$4,841</b>
15	Interest Expense	525	611	684
16	<b>Income Before Tax</b>	<b>\$3,281</b>	<b>\$1,915</b>	<b>\$4,157</b>
17	Income Tax Expense	984	575	1,247
18	<b>Net Income</b>	<b>\$2,297</b>	<b>\$1,340</b>	<b>\$2,910</b>
20	Shares Issued and Outstanding	1,000	1,000	1,000
21	<b>Earnings Per Share</b>	<b>\$2.30</b>	<b>\$1.34</b>	<b>\$2.91</b>

<b>Income Statement</b>				
<b>ShopNow!</b>				
<i>(Common Size - % of Sales)</i>				
	2011	2012	2013	
29	<b>Revenue</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
30	Cost of Goods Sold	64%	71%	64%
31	<b>Gross Profit</b>	<b>36%</b>	<b>29%</b>	<b>36%</b>
32	SG&A	22%	21%	24%
33	<b>EBITDA</b>	<b>14%</b>	<b>8%</b>	<b>11%</b>
34	Depreciation & Amortization	3%	3%	3%
35	<b>EBIT</b>	<b>11%</b>	<b>5%</b>	<b>9%</b>
36	Interest Expense	2%	1%	1%
37	<b>Income Before Tax</b>	<b>10%</b>	<b>4%</b>	<b>7%</b>
38	Income Tax Expense	3%	1%	2%
39	<b>Net Income</b>	<b>7%</b>	<b>3%</b>	<b>5%</b>

# Earnings Per Share (EPS)

A widely used measure of profitability and must be reported on the income statement if the company is publicly traded.

$$\text{Basic EPS} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Average Outstanding Shares}}$$

# Balance Sheet

Represents a snapshot of the firm's holdings at a specific point in time.

Most are classified.

The Swiss Army Knife of Financial Identities:

$$\text{Assets} = \text{Liabilities} + \text{Equity}$$

# The Balance Sheet

- Assets
- Liabilities
- Shareholders' Equity

Balance Sheet					
ShopNow!					
(\$millions)					
As of December 31,			Change in Balance Sheet		
	2011	2012	2013	2011 to 2012	2012 to 2013
<b>ASSETS</b>					
Cash & Cash Equivalents	\$682	\$3,515	\$6,807	\$2,833	\$3,292
Accounts Receivable	5,008	5,083	6,082	75	999
Inventory	4,284	4,984	6,460	700	1,476
Other Current Assets	766	2,167	1,468	1,401	(699)
<b>Total Current Assets</b>	<b>\$10,740</b>	<b>\$15,749</b>	<b>\$20,817</b>	<b>\$5,009</b>	<b>\$5,068</b>
Gross PP&E	\$18,842	\$21,868	\$26,726	\$3,026	\$4,858
Accumulated Depreciation	5,066	6,273	7,783	1,207	1,510
<b>Net PP&amp;E</b>	<b>\$13,776</b>	<b>\$15,595</b>	<b>\$18,943</b>	<b>\$1,819</b>	<b>\$3,348</b>
Other Noncurrent Assets	\$1,224	\$1,642	\$1,813	\$418	\$171
<b>TOTAL ASSETS</b>	<b>\$25,740</b>	<b>\$32,986</b>	<b>\$41,573</b>	<b>\$7,246</b>	<b>\$8,587</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
<b>Current Liabilities</b>					
Accounts Payable	\$4,215	\$5,451	\$6,934	\$1,236	\$1,483
Current Portion of Long-Term Debt	879	1,016	606	137	(410)
Accrued Expenses	1,390	1,416	1,959	26	543
Income Taxes and Other	287	1,327	364	1,040	(963)
<b>Total Current Liabilities</b>	<b>\$6,771</b>	<b>\$9,210</b>	<b>\$9,863</b>	<b>\$2,439</b>	<b>\$653</b>
<b>Long Term Liabilities</b>					
Deferred Income Taxes and Other	\$1,305	\$1,996	\$2,412	\$691	\$416
Long-Term Debt	9,167	12,193	17,051	3,026	4,858
<b>Total Long Term Liabilities</b>	<b>\$10,472</b>	<b>\$14,189</b>	<b>\$19,463</b>	<b>\$3,717</b>	<b>\$5,274</b>
<b>Total Liabilities</b>	<b>\$17,243</b>	<b>\$23,399</b>	<b>\$29,326</b>	<b>\$6,156</b>	<b>\$5,927</b>
<b>Shareholders' Equity</b>					
Common Stock	\$68	\$68	\$68	\$0	\$0
Additional Paid-In Capital	1,130	1,130	1,130	0	0
Retained Earnings	7,299	8,389	11,049	1,090	2,660
<b>Shareholders' Equity</b>	<b>\$8,497</b>	<b>\$9,587</b>	<b>\$12,247</b>	<b>\$1,090</b>	<b>\$2,660</b>
<b>TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY</b>	<b>\$25,740</b>	<b>\$32,986</b>	<b>\$41,573</b>	<b>\$7,246</b>	<b>\$8,587</b>
Balance Check (OK or Error)	OK	OK	OK		

# The Balance Sheet - Assets

	A	D	E	F	G	H
1	<b>Balance Sheet</b>					
2	<b>ShopNow!</b>					
3	<i>(Millions)</i>					
6	As of December 31,			Change in Balance Sheet		
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20	<b>TOTAL ASSETS</b>	<b>\$25,740</b>	<b>\$32,986</b>	<b>\$41,573</b>	<b>\$7,246</b>	<b>\$8,587</b>

# The Balance Sheet - Liabilities

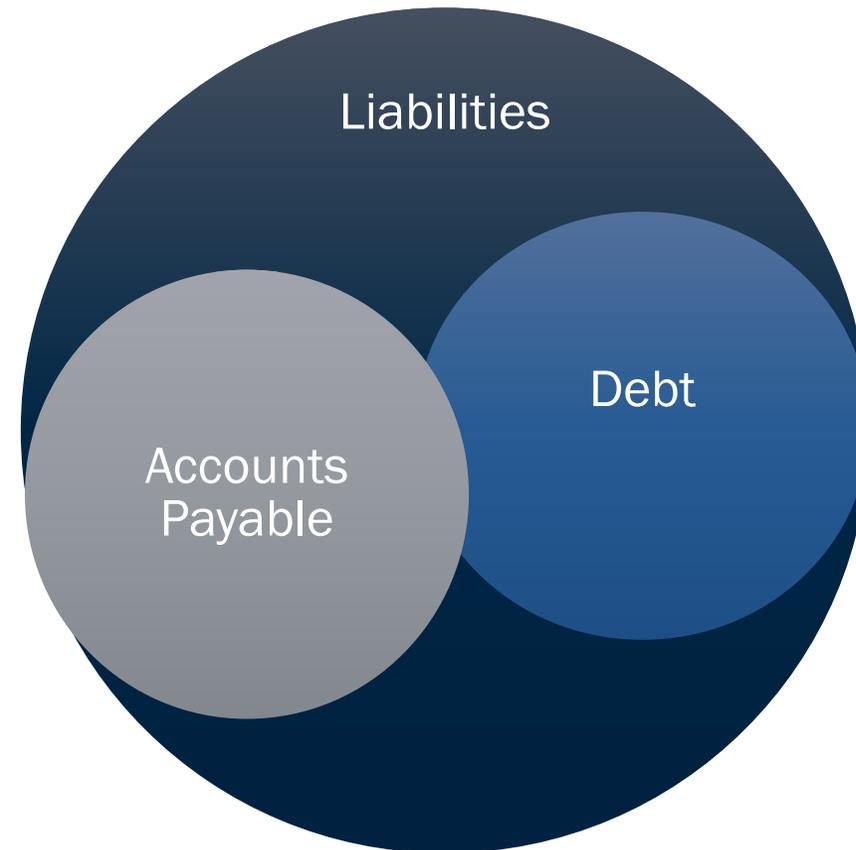
22	<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
23	<b>Current Liabilities</b>					
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26	Accrued Expenses	1,390	1,416	1,959	26	543
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43	Balance Check (OK or Error)	OK	OK	OK		

# The Difference between Debt and Liabilities

Liabilities are amounts owed, regardless of form.

Debt refers only to obligations that require interest payments.

Debts are a subset of liabilities.

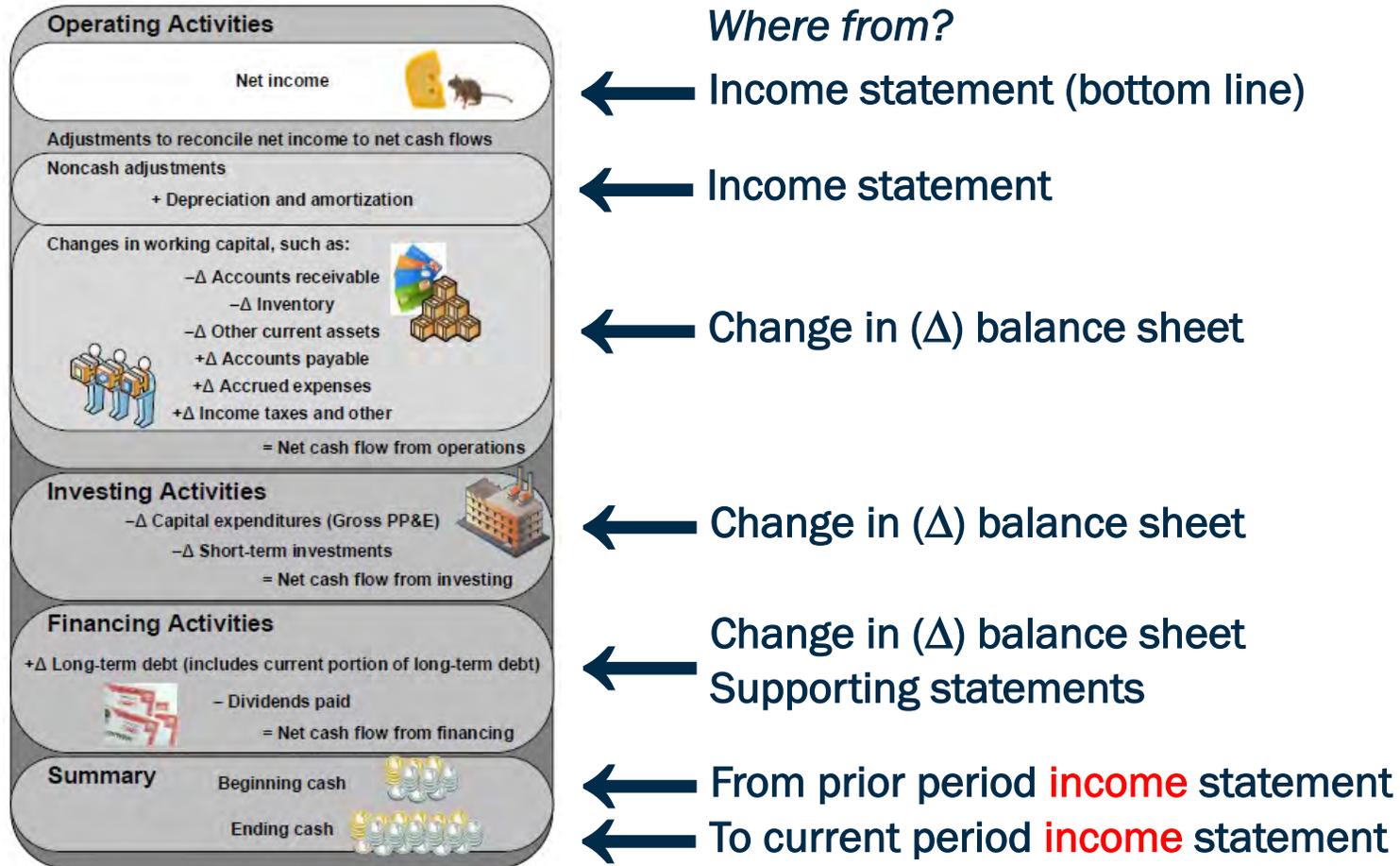


# Shareholders' Equity

22	<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
23	<b>Current Liabilities</b>					
24	Accounts Payable	\$4,215	\$5,451	\$6,934	\$1,236	\$1,483
25	Current Portion of Long-Term Debt	879	1,016	606	137	(410)
26	Accrued Expenses	1,390	1,416	1,959	26	543
27	Income Taxes and Other	287	1,327	364	1,040	(963)
28	<b>Total Current Liabilities</b>	<b>\$6,771</b>	<b>\$9,210</b>	<b>\$9,863</b>	<b>\$2,439</b>	<b>\$653</b>
30	<b>Long Term Liabilities</b>					
31	Deferred Income Taxes and Other	\$1,305	\$1,996	\$2,412	\$691	\$416
32	Long-Term Debt	9,167	12,193	17,051	3,026	4,858
33	<b>Total Long Term Liabilities</b>	<b>\$10,472</b>	<b>\$14,189</b>	<b>\$19,463</b>	<b>\$3,717</b>	<b>\$5,274</b>
34	<b>Total Liabilities</b>	<b>\$17,243</b>	<b>\$23,399</b>	<b>\$29,326</b>	<b>\$6,156</b>	<b>\$5,927</b>
36	Common Stock	\$68	\$68	\$68	\$0	\$0
37	Additional Paid-In Capital	1,130	1,130	1,130	0	0
38	Retained Earnings	7,299	8,389	11,049	1,090	2,660
39	<b>Shareholders' Equity</b>	<b>\$8,497</b>	<b>\$9,587</b>	<b>\$12,247</b>	<b>\$1,090</b>	<b>\$2,660</b>
41	<b>TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY</b>	<b>\$25,740</b>	<b>\$32,986</b>	<b>\$41,573</b>	<b>\$7,246</b>	<b>\$8,587</b>
43	Balance Check (OK or Error)	OK	OK	OK		



# The Statement of Cash Flows



# Sources and Uses of Cash Flow

## Source of funds:

1. Decrease in an asset
2. Increase in a liability

## Use of funds:

1. Increase in an asset
2. Decrease in a liability

# The Statement of Cash Flows

- Indirect method
- Direct method; provides more information

	2012	2013	Source
<b>Statement of Cash Flows</b>			
<b>ShopNow!</b>			
<i>Indirect Method</i>			
<i>(\$millions)</i>			
For the Years Ended December 31,			
	<u>2012</u>	<u>2013</u>	
<b>Cash flows from Operating Activities</b>			<b>Source</b>
Net Income	\$1,340	\$2,910	Income Statement
<i>Adjustments to Reconcile Net Income to Net Cash Flow</i>			
Noncash Adjustments			
+ Depreciation and Amortization	\$1,207	\$1,510	Income Statement
<i>Changes in Working Capital</i>			
Decrease (Increase) in A/R	(\$75)	(\$999)	-Δ Balance Sheet
Decrease (Increase) in Inventory	(700)	(1,476)	-Δ Balance Sheet
Decrease (Increase) in Other Current Assets	(1,401)	699	-Δ Balance Sheet
Increase (Decrease) in A/P	1,236	1,483	Δ Balance Sheet
Increase (Decrease) in Accrued Expenses	26	543	Δ Balance Sheet
Increase (Decrease) in Income Taxes and Other	1,040	(963)	Δ Balance Sheet
<b>Net Cash Flow From Operating Activities</b>	<b>\$2,673</b>	<b>\$3,707</b>	
<b>Cash flows from Investing Activities</b>			
CapEx Spend	(\$3,026)	(\$4,858)	-Δ Balance Sheet
<i>Changes in LT Assets &amp; Liabilities</i>			
Decrease (Increase) in Other Noncurrent Assets	(\$418)	(\$171)	-Δ Balance Sheet
Increase (Decrease) in Deferred Income Taxes and Other	691	416	Δ Balance Sheet
<b>Net Cash Flow from Investing Activities</b>	<b>(\$2,753)</b>	<b>(\$4,613)</b>	
<b>Cash flows from Financing Activities</b>			
Increase (Decrease) in Long-Term Debt [Source (Use) of Cash]	\$3,163	\$4,448	Δ Balance Sheet
Less Dividends Paid	(250)	(250)	Inputs
<b>Net Cash Flow from Financing Activities</b>	<b>\$2,913</b>	<b>\$4,198</b>	
<b>Summary</b>			<b>PY Balance</b>
Beginning Cash	\$682	\$3,515	Balance Sheet Cash
Ending Cash	<u>3,515</u>	<u>6,807</u>	
Minimum Cash Balance	250	250	Inputs
Excess (Required) Cash	<u>\$3,265</u>	<u>\$6,557</u>	

# Interpreting the Financial Statements Story

Do the financials match up with the firm's intended strategy?

How is the organization financing growth or reinvesting its earnings?

Is it efficient and effective at managing its assets and liabilities?

Is it in a position to have strong growth?



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# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 4: Ratio Analysis**

# Ratio Analysis

## *Topics Overview*

- *Liquidity Ratios*
- *Leverage Ratios*
- *Activity Ratios*
- *Profitability Ratios*
- *Market Ratios*
- *Limitations and Uses of Ratios*
- *Common-Size and Percentage-Change Financial Statements*

# Primary Uses of Financial Ratios

## Basic calculation for measurement purposes

- Financial reporting

## Comparisons and Benchmarking

- Trend analysis/ time-series
- Cross-sectional

## Financial planning and forecasting

- Basic optimization

*Limitation on comparisons across firms: Need consistent accounting policies/procedures*

# Types of Ratios

Type of Ratio	What Is Measured
Liquidity (Working Capital)	An organization's ability to pay off its short-term debt obligations while still funding ongoing operations
Leverage	The types of force multipliers (i.e., financial and operational) an organization uses to increase its value and the extent to which it relies on them
Activity (Efficiency)	How efficiently an organization is able to turn its assets into sales or cash
Profitability	An organization's ability to generate earnings as compared to its expenses and other costs over a specified time-period.
Market Value	How an organization is valued by investors

# Liquidity Ratios: Current Ratio



Current assets may include:

Cash  
Marketable securities  
Accounts receivable  
Inventories



Current liabilities may include:

Accounts payable  
Short-term notes payable  
Currently-maturing long-term debt  
Accrued taxes and other expenses

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

# Liquidity Ratios

## Quick Ratio

$$\frac{\text{Cash} + \text{Cash Equivalents} + \text{Short Term Investments} + \text{Accounts Receivable}}{\text{Current Liabilities}}$$

OR

$$\frac{\text{Current Assets} - \text{Inventories} - \text{Other Current Assets}}{\text{Current Liabilities}}$$

## Cash Ratio

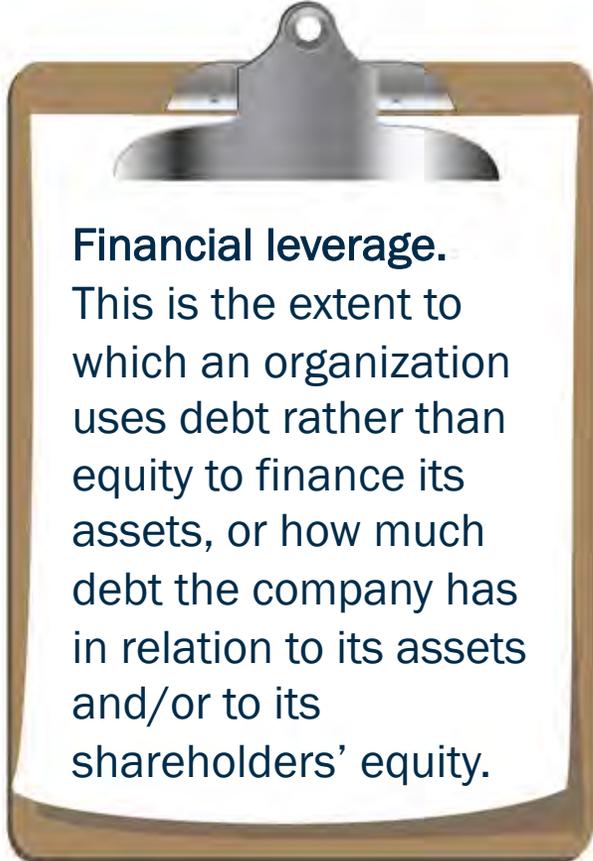
$$\frac{\text{Cash} + \text{Cash Equivalents} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

# Financial & Operational Leverage



**Operational leverage.**

This is the extent to which an organization's operations involve fixed rather than variable costs.



**Financial leverage.**

This is the extent to which an organization uses debt rather than equity to finance its assets, or how much debt the company has in relation to its assets and/or to its shareholders' equity.

# Leverage Ratios

## Debt Levels:

- Debt to Total Assets Ratio
- Total Debt to Equity Ratio and Long-Term Debt to Equity Ratio

## Coverage Ratios:

- Interest Coverage =  $\text{EBIT} / \text{Interest Expense}$
- Cash Coverage =  $(\text{EBIT} + \text{Depreciation Expense}) / \text{Interest Expense}$

# Financial and Operating Leverage Ratios

## Degree of Operating Leverage Ratio

$$\frac{\% \text{ Change in EBIT}}{\% \text{ Change in Sales}}$$

## Degree of Financial Leverage Ratio

$$\frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}}$$

OR

$$\frac{\% \text{ Change in Net Income}}{\% \text{ Change in EBIT}}$$

# Leverage Ratios: Degree of Total Leverage

The calculations are as follows:

$$\text{Degree of Total Leverage} = \text{Degree of Operating Leverage} \times \text{Degree of Financial Leverage}$$

which is equivalent to:

$$\text{Degree of Total Leverage} = \frac{\% \text{ Change in EBIT}}{\% \text{ Change in Revenue}} \times \frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}}$$

which factors down to:

$$\text{Degree of Total Leverage} = \frac{\% \text{ Change in EPS}}{\% \text{ Change in Revenue}}$$

# Activity Ratios

- How effective and efficient is the firm at generating revenues from assets?
  - *For many of the activity ratios, revenues are scaled by the account item listed.*
- Average Asset Turnover
- Average Fixed Assets Turnover
- Average Working Capital Turnover
- Average Receivables Turnover
- Average Inventory Turnover\*
- Average Payables Turnover\*

# Activity Ratios

## Cash Conversion Cycle

$$\text{DIO} + \text{DSO} - \text{DPO}$$

*Where:*

DIO = Days' Inventory Outstanding

DSO = Days' Sales Outstanding

DPO = Days' Payables Outstanding

# Profitability Margins

- **Gross Margin** =  $\frac{\text{Revenues} - \text{COGS}}{\text{Revenue}}$
- **EBITDA Margin** =  $\frac{\text{EBITDA}}{\text{Revenue}}$
- **EBIT Margin** =  $\frac{\text{EBIT}}{\text{Revenue}}$
- **Profit Margin** =  $\frac{\text{NI}}{\text{Revenue}}$

# Profitability Ratios

## ROA

$$\frac{\text{Net Income}}{\text{Average Total Assets}}$$

## ROE

$$\frac{\text{Net Income}}{\text{Average Shareholders' Equity}}$$

# DuPont Analysis

GOAL	Operating Efficiency		Asset Efficiency		Financial Leverage
METRIC	Profit Margin		Average Total Assets Turnover		Average Equity Multiplier
EQUATION	$\frac{\text{Net Income}}{\text{Revenue}}$	×	$\frac{\text{Revenue}}{\text{Average Total Assets}}$	×	$\frac{\text{Average Total Assets}}{\text{Average Equity}}$

$$\text{ROA} \left( \frac{\text{Net Income}}{\text{Average Total Assets}} \right) = \left( \frac{\text{Net Income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average Total Assets}} \right) \times \frac{\text{Average Total Assets}}{\text{Average Equity}} = \text{ROE} \left( \frac{\text{Net Income}}{\text{Average Equity}} \right)$$

# Additional Measures of Profitability

- Return on Investment
- Return on Capital Employed
- Earnings Per Share
  - Basic versus Diluted
- Economic Profit
- Free Cash Flow
- Free Cash Flow to Equity

# Market Ratios

- Price to Earnings
- Price to Book
- Price to Sales
- Price to Cash Flow
- Price to EBITDA
- Dividend Yield
- Earnings Yield

# Common-Size Analysis

From income statement data		
	MacroCorp	LittleInc.
Net sales	\$125,486,886	\$17325,003
Cost of sales	\$108,797,130	\$14,258,477
Gross profit	\$16,689,756	\$3,066,526
From common-size income statement data		
	MacroCorp	LittleInc.
Net sales	100%	100%
Cost of sales	86.7%	82.3%
Gross profit	13.3%	17.7%

# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 5: Managerial and Cost Accounting**

# Managerial and Cost Accounting

## *Topics Overview*

- *Cost Concepts*
- *Cost-Volume-Profit (CVP) Analysis*
- *Types of Staffing Expenses*
- *Budgets*
- *Management Reports*

# Financial vs. Managerial Accounting

Financial Accounting	Managerial Accounting
<ul style="list-style-type: none"><li>• Provides information for internal and external users</li><li>• Focuses on past results</li><li>• Follows GAAP or IFRS</li><li>• Reports on standard, externally mandated time spans</li><li>• Reports on the organization as a whole</li></ul>	<ul style="list-style-type: none"><li>• Provides information for internal managers only</li><li>• Focuses on future results</li><li>• Follows rules to meet the particular needs of the organization</li><li>• Reports on various time spans dependent on the particular need</li><li>• Reports on any subset of the organization</li></ul>

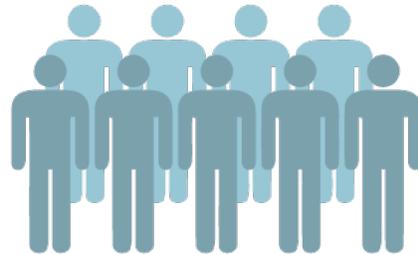
# Cost Objects

Cost Object	Description
Product	The Ergochair 5000
Department	The R&D department that studies ergonomics
Service	The online help system to support chair retailers
Customer	ChairMania, Inc., a major retailers of the Ergochair 5000
Project	The R&D project to improve ergonomics for the next generation chair
Activities	The assembly line set up for the production of the Ergochair 5000

# Manufacturing Cost Classifications



Direct Materials



Direct Labor



Overhead

- Manufacturing
- Corporate

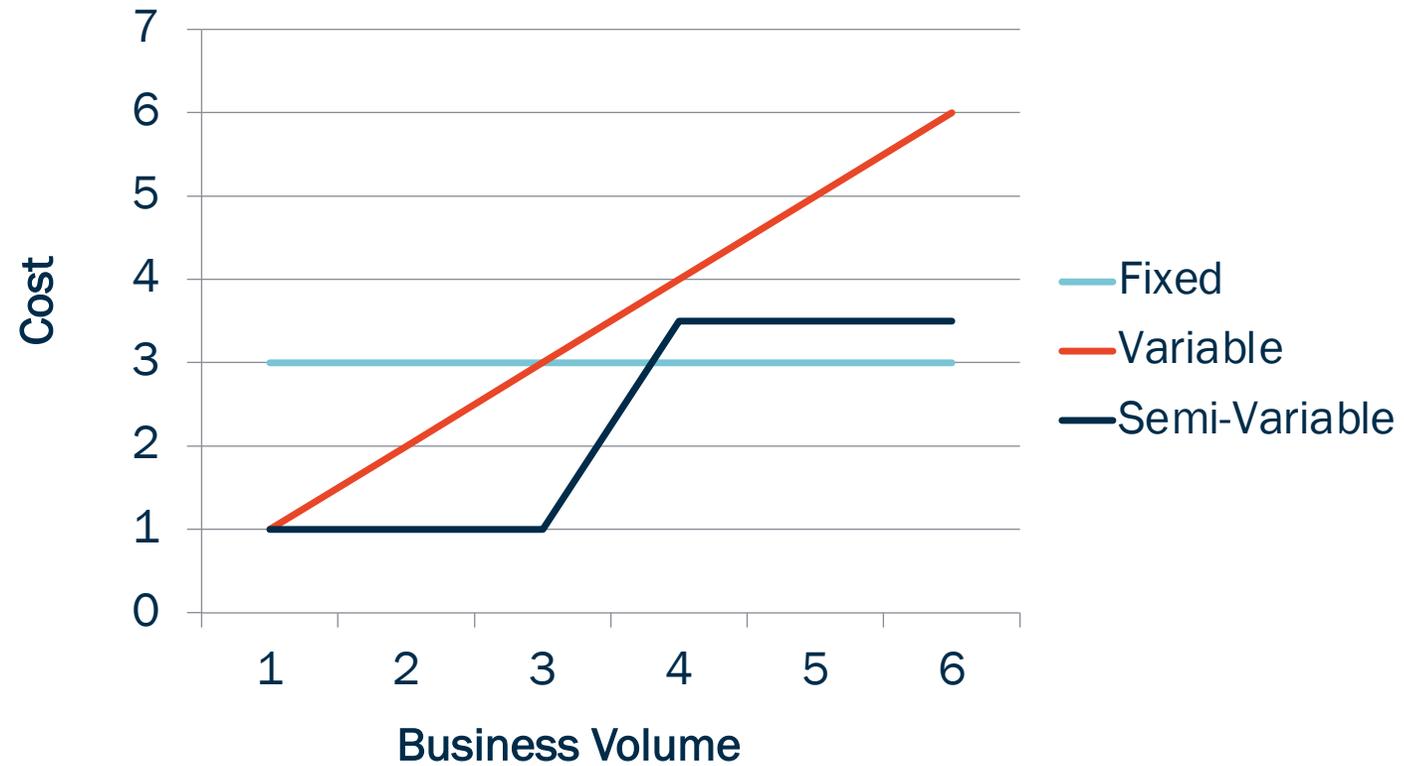
# Cost Classifications

Product  
Costs



Period  
Costs

# Cost Behavior Patterns



# Discussion Question

How is unit cost calculated?



Answer:

$$\frac{\text{Total Fixed Cost} + \text{Total Variable Cost}}{\text{Quantity}}$$

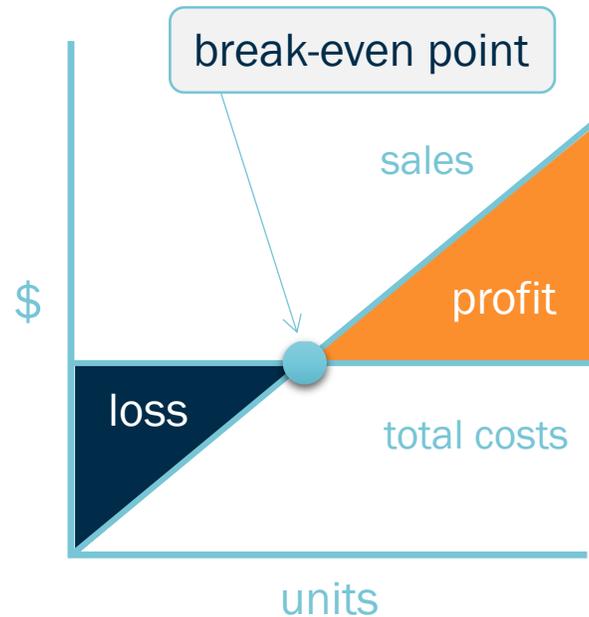
# Contribution Margin

Revenue – Variable Costs = Contribution Margin

		Number of Chairs Sold		
		0	1,000	2,000
Revenues	\$600/chair	\$0	\$600,000	\$1,200,000
Variable Costs	\$400/chair	\$0	\$400,000	\$800,000
Contribution Margin	\$200/chair	\$0	\$200,000	\$400,000
Fixed Costs	\$200,000	\$200,000	\$200,000	\$200,000
Operating Income		<u>(\$200,000)</u>	<u>\$0</u>	<u>\$200,000</u>

# CVP

Method of determining how many units need to be sold to break even or make a profit.



# Equation Method

$$\text{Operating Income} = \left( \text{Price} \times \text{Quantity Sold} \right) - \left( \text{Variable Cost per Unit} \times \text{Quantity Sold} \right) - \text{Fixed Costs}$$

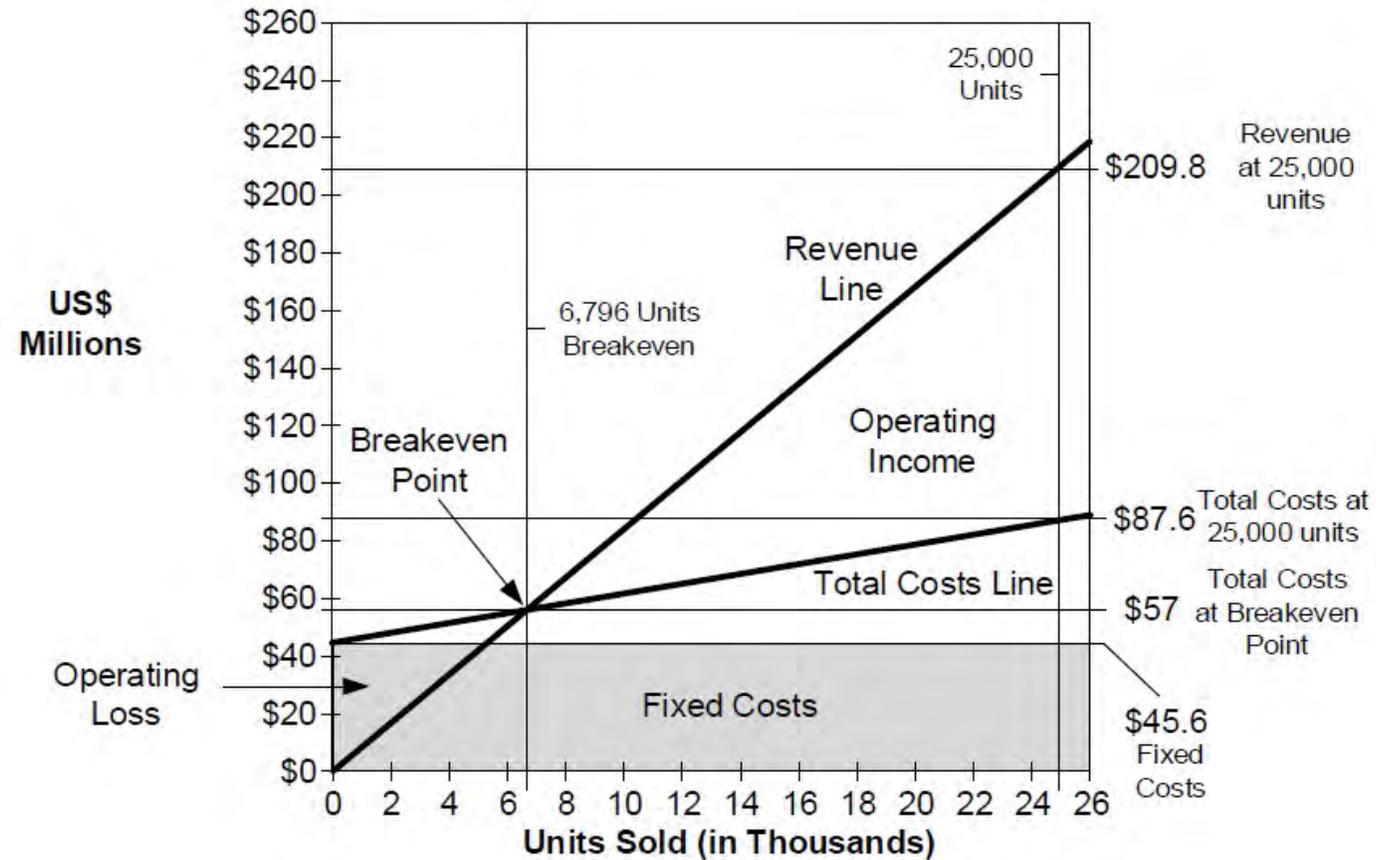
# Contribution Method

$$\text{Operating Income} = \left( \text{Contribution Margin per Unit} \times \text{Quantity Sold} \right) - \text{Fixed Costs}$$

# Contribution Method

$$\text{Quantity Sold} = \frac{\text{Operating Income} + \text{Fixed Costs}}{\text{Contribution Margin per Unit}}$$

# Graph Method



# Scenario Analysis

	A	B	C	D	E	F	G	H
1	<b>Panama Mine Division</b>							
2	<b>CVP Scenarios for Target Operating Income if Units Sell for \$8,390 per Unit</b>							
3				<b>Units Sold to Achieve Target Operating Income</b>				
4		<b>Variable Costs/Unit</b>	<b>Fixed Costs</b>	<b>Breakeven</b>	<b>\$80,000,000</b>	<b>\$105,400,000</b>	<b>\$122,200,000</b>	
5	<b>Worst</b>	\$2,000	\$50,000,000	7,825	20,344	24,319	26,948	Units
6	<b>Variable</b>	\$2,000	\$45,600,000	7,136	19,656	23,631	26,260	Units
7	<b>Costs/Unit</b>	\$2,000	\$40,000,000	6,260	18,779	22,754	25,383	Units
8	<b>Base</b>	\$1,680	\$50,000,000	7,452	19,374	23,159	25,663	Units
9	<b>Variable</b>	\$1,680	\$45,600,000	6,796	18,718	22,504	25,007	Units
10	<b>Costs/Unit</b>	\$1,680	\$40,000,000	5,961	17,884	21,669	24,173	Units
11	<b>Best</b>	\$1,450	\$50,000,000	7,205	18,732	22,392	24,813	Units
12	<b>Variable</b>	\$1,450	\$45,600,000	6,571	18,098	21,758	24,179	Units
13	<b>Costs/Unit</b>	\$1,450	\$40,000,000	5,764	17,291	20,951	23,372	Units

# Staffing Expenses

Labor costs can be defined and classified in various ways, including:

Direct labor (product costs)

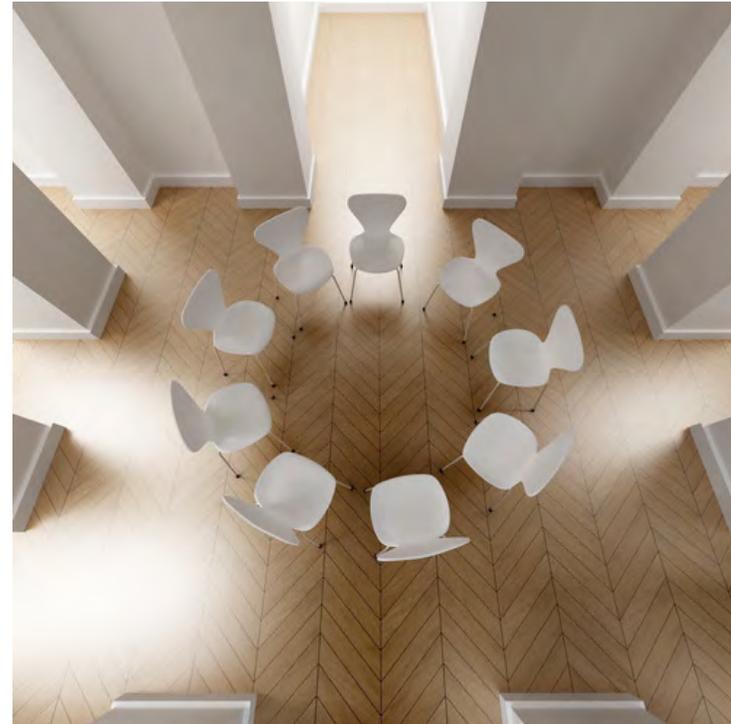
Indirect labor (period costs)

Discretionary labor costs

Nondiscretionary-labor costs that are or are not within management control

Recurring and non-recurring

Costs by cost driver



# Labor Costs Included Within Overhead



# Indirect Labor Costs

## Workers:

Administrative staff costs (headquarters costs might be tracked separately from costs at other locations or in other business units)

Office security or cleaning staff (unless outsourced)



## Time:

Overtime that cannot be charged directly to a specific product

Time costs of rework

Idle time

Training time

Sick leave

Vacation time



# How Headcount Analyses and Projections Fit Into Strategic Planning



# Purpose of Headcount Analyses, Projections and Gap Analyses



# Staffing Projections

Non-labor cost elements:



Office space, supplies, equipment (e.g., computers) and related depreciation costs



Support costs (e.g., IT hardware and maintenance, software licenses)



Staff training costs

# Staffing Decisions

Sales revenues or volume

New product sales volume or revenues

Employee turnover rates and retirement eligibilities

Unusual events that can drive headcount requirements up or down

Interrelationship of staffing costs



# Headcount Projection Methods

Methods for headcount projections include:

Headcount projection calculations with gap analysis,

Headcount projection summaries,

Headcount control models, and

Common-sizing by headcount.



# Headcount Projection Calculations with Gap Analysis

	A	B	C	D	E
1	<b>Copper Mine Co. Panama Mine Division Department Headcount Projection</b>				
2	<b>Headcount Projection and Gap Analysis</b>				
3	<b>Planning Period</b>		2014		
4					
5	<b>Job Role</b>		<b>Miner (Skilled)</b>		<b>Miller (Skilled)</b>
6	Current Employees (FTE)		122.5		110
7	Employees at Retirement Age Over Planning Period		10		8
8	Retirement Age Retirement Rate		60%		50%
9	Estimate of Number of Retirees		6		4
10	Non-Retirement Age Turnover Rate (Actual)		11%		9%
11	Non-Retirement Age Turnover Rate (Projected)		10%		8%
12	Estimate of Non-Retirement Age Turnover (Projected)		12.25		8.8
13	Projected Employee Supply		104.25		97.2
14	Projected Employee Demand (Required)		102.5		106
15	Surplus (Gap)		1.75		(8.80)

# Headcount Projection Summary Data

D29     $=(\text{Inputs!D5}*\text{Inputs!D7})/\text{Headcount!H47}$

1 **Copper Mine Co. Panama Mine Division Department Headcount Projection**  
 2 **Headcount Summaries Tab**  
 3 All amounts in US\$ thousands (000s)

Department Summaries	Total Employees	Com-Size	Total Salary	Fringe Benefits	Salary + Benefits	Bonus Rate	Bonuses	Stock Options	Total Comp.	Com-Size Comp.
Executive	4.0	0.5%	\$3,400	\$884	\$4,284	12%	\$408	\$700	\$5,392	8.6%
Finance	4.3	0.5%	\$605	\$157	\$762	8%	\$48	\$50	\$861	1.4%
Accounting	11.0	1.3%	\$1,140	\$296	\$1,436		\$0	\$50	\$1,486	2.4%
HR	6.0	0.7%	\$570	\$148	\$718		\$0	\$50	\$768	1.2%
IT	9.5	1.1%	\$1,160	\$302	\$1,462		\$0	\$50	\$1,512	2.4%
Operations VP	1.0	0.1%	\$260	\$68	\$328	10%	\$26	\$50	\$404	0.6%
Marketing	3.0	0.4%	\$490	\$127	\$617	5%	\$25	\$50	\$692	1.1%
Sales	4.8	0.6%	\$750	\$195	\$945	35%	\$263	\$50	\$1,258	2.0%
Management Total	27.0	3.2%	\$16,360	\$4,254	\$20,614		\$612	\$1,050	\$22,276	35.5%
Indirect Labor Total	32.5	3.9%	\$3,215	\$836	\$4,051		\$158	\$0	\$4,208	6.7%
Operations DL	779.0	92.9%	\$28,851	\$7,501	\$36,352		\$0	\$0	\$36,352	57.9%
<b>Total</b>	<b>838.5</b>	<b>100.0%</b>	<b>\$48,426</b>	<b>\$12,591</b>	<b>\$61,017</b>		<b>\$769</b>	<b>\$1,050</b>	<b>\$62,836</b>	<b>100.0%</b>

Quarterly Projections	Total Salary	Fringe Benefits	Salary + Benefits
Q1	\$12,395	\$3,223	\$15,618
Q2	\$12,478	\$3,244	\$15,722
Q3	\$11,803	\$3,069	\$14,871
Q4	\$11,750	\$3,055	\$14,805

Metrics:	Value	Unit
Revenue/FTE	\$287	US\$ (000s)
Total Comp./FTE	\$75	US\$ (000s)
EBITDA/FTE	\$32	US\$ (000s)
Net Income/FTE	\$15	US\$ (000s)

**Qtr. Projections**

Quarter	Total Salary	Fringe Benefits
Q1	\$12,395,000	\$3,223,000
Q2	\$12,478,000	\$3,244,000
Q3	\$11,803,000	\$3,069,000
Q4	\$11,750,000	\$3,055,000

# Headcount Control Models



# Common Sizing by Headcount

	For the year ended Dec 31,				
	Q1	Q2	Q3	Q4	2013
Revenue	\$14,412,000	\$12,490,400	\$16,059,085	\$13,708,975	\$56,670,460
Cost of Goods Sold	\$9,272,243	\$8,035,944	\$10,331,928	\$8,819,939	\$36,460,054
Gross Profit	\$5,139,757	\$4,454,456	\$5,727,157	\$4,889,036	\$20,210,406
SG&A	\$3,511,333	\$3,043,155	\$3,912,628	\$3,340,048	\$13,807,164
EBITDA	\$1,628,424	\$1,411,301	\$1,814,529	\$1,548,988	\$6,403,242
Depreciation & Amortization Exp.	\$387,384	\$335,733	\$431,657	\$368,487	\$1,523,261
EBIT	\$1,241,040	\$1,075,568	\$1,382,872	\$1,180,501	\$4,879,981
Interest Expense	\$175,384	\$152,000	\$195,428	\$166,829	\$689,641
Income Before Tax	\$1,065,656	\$923,568	\$1,187,444	\$1,013,672	\$4,190,340
Income Tax Expense	\$382,000	\$331,066	\$425,657	\$363,365	\$1,502,088
Income (Loss) from Extraordinary Items or Discontinued Operations	\$404,000	\$350,133	\$450,171	\$384,292	\$1,588,596
Net Income (Actual)	\$1,087,656	\$942,635	\$1,211,958	\$1,034,599	\$4,276,848
Budgeted EBITDA	\$1,900,000	\$1,700,000	\$2,100,000	\$1,800,000	\$7,500,000

(continued)

	For the year ended Dec 31,				
	Q1	Q2	Q3	Q4	2013
<b>Common Size by Headcount</b>					
Sales Floor Headcount	85	85	86	86	
Cost Centers Headcount	80	80	82	82	
Total Headcount	165	165	168	168	
Revenue	\$87,345	\$75,699	\$95,590	\$81,601	\$340,236
Cost of Goods Sold	\$56,195	\$48,703	\$61,500	\$52,500	\$218,897
Gross Profit	\$31,150	\$26,997	\$34,090	\$29,101	\$121,338
SG&A	\$21,281	\$18,443	\$23,289	\$19,881	\$82,895
EBITDA	\$9,869	\$8,553	\$10,801	\$9,220	\$38,444
Depreciation & Amortization Exp.	\$2,348	\$2,035	\$2,569	\$2,193	\$9,145
EBIT	\$7,521	\$6,519	\$8,231	\$7,027	\$29,298
Interest Expense	\$1,063	\$921	\$1,163	\$993	\$4,140
Income Before Tax	\$6,459	\$5,597	\$7,068	\$6,034	\$25,158
Income Tax Expense	\$2,315	\$2,006	\$2,534	\$2,163	\$9,018
Income (Loss) from Extraordinary Items or Discontinued Operations	\$2,448	\$2,122	\$2,680	\$2,287	\$9,538
Net Income (Actual)	\$6,592	\$5,713	\$7,214	\$6,158	\$25,677
Budgeted EBITDA	\$11,515	\$10,303	\$12,500	\$10,714	\$45,032

# Inputs for Common-Size Headcount Projected Results

	A	B	C	D	E
1	<b>Retailer Quarterly Income Statement</b>				
2	2014 Projection Inputs				
3					
4					
5		<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>
6	<b>Prior Year Sales Floor Headcount</b>	85	85	86	86
7	<b>Prior Year Cost Centers Headcount</b>	80	80	82	82
8	<b>Prior Year Actual Total Headcount</b>	<b>165</b>	<b>165</b>	<b>168</b>	<b>168</b>
9	<b>Projected Sales Floor Headcount</b>	90	90	90	90
10	<b>Projected Cost Centers Headcount</b>	78	78	78	78
11	<b>Projected Total Headcount</b>	<b>168</b>	<b>168</b>	<b>168</b>	<b>168</b>
12	<b>Prior Year Actual Quarterly Revenue per Salesperson</b>	<b>\$169,553</b>	<b>\$146,946</b>	<b>\$186,734</b>	<b>\$159,407</b>
13	<b>Per Salesperson Improvement</b>	10%	10%	10%	10%
14	<b>COGS Rate</b>	64.337%	all quarters		
15	<b>SG&amp;A Rate</b>	24.364%	all quarters		
16	<b>Depreciation &amp; Amortization</b>	2.688%	all quarters		
17	<b>Interest Expense</b>	1.217%	all quarters		
18	<b>Income Tax Expense</b>	2.651%	all quarters		

# Budgets

Formalize and quantify management's long-term goals

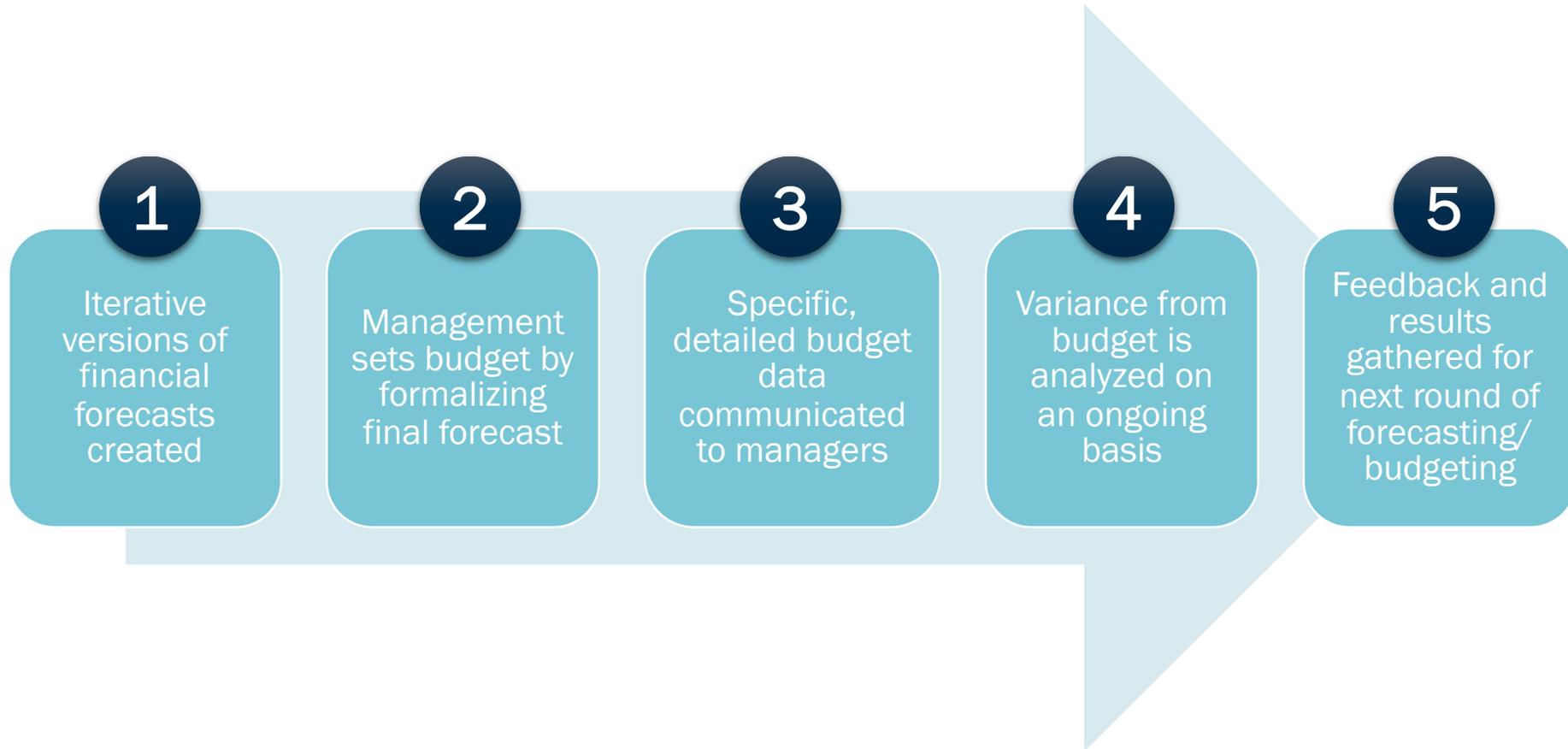
Coordinate organization-wide efforts, down to the department level

Provide a means of judging, motivating, and compensating for performance

Cover periods ranging from a month to two years; most commonly used annually



# Budgeting Process



# Steps to Creating a Budget

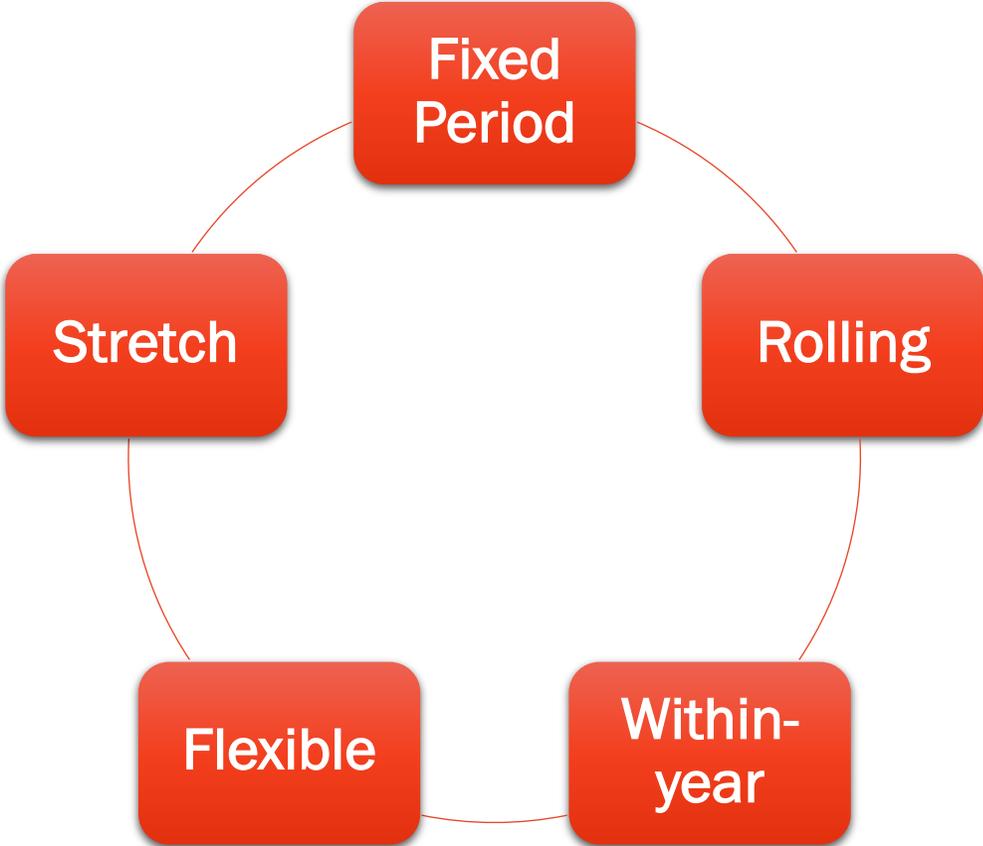
## 1 Construct the operating budget

1. Develop sales budget
2. Develop corresponding production, purchasing and operating expense budgets

## 2 Construct the financial budget

1. Develop capital budget
2. Develop cash budget
3. Identify financial sources

# Types of Budgets



# Discussion Question

What is the FP&A professional's involvement in the budget process?



**Answer:**

- FP&A generally owns the process
  - Shepherds forecast iterations through the process
  - Analyzes impacts across functional areas
  - Provides scenario analysis
  - Performs variance analysis

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Part 1

Domain A: Concepts of Business and  
Finance

Chapter 5: Managerial and Cost  
Accounting

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# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 6: Macroeconomics**

# Macroeconomics

## *Topics Overview*

- *Macroenvironment forces*
- *Common metrics with which analysts should be familiar*
- *Sources of risk in the macroenvironment*
- *Sources of macroeconomic information*

# Macroenvironment Forces

PESTLE

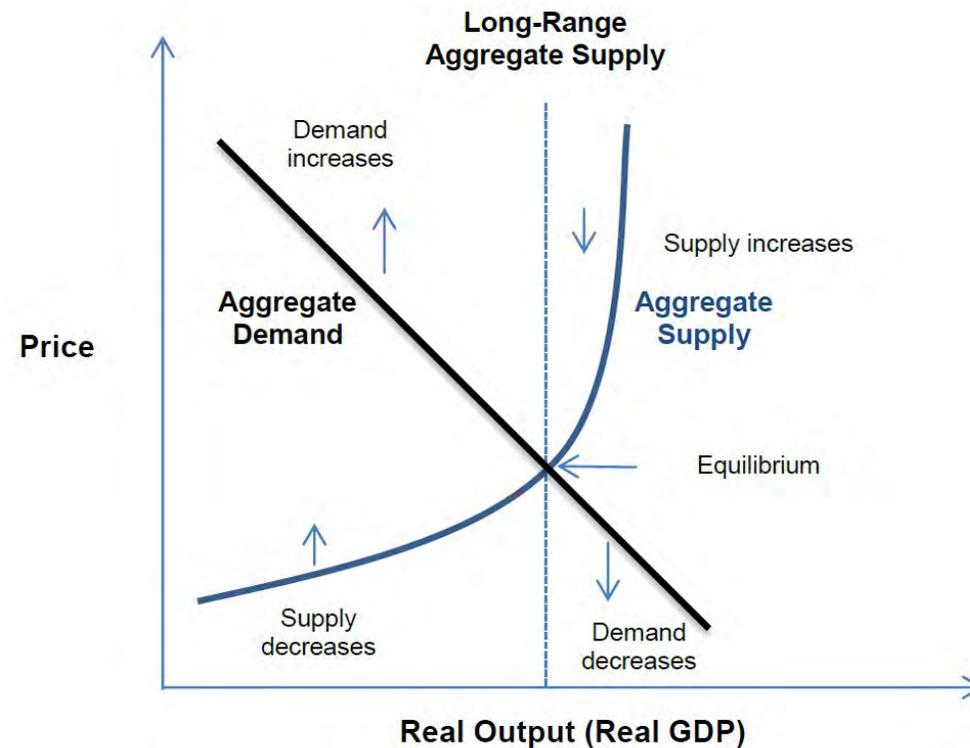
Regulations

Macroeconomics

Business cycles



# AD-AS Model: Axes represent “overall” price or output levels



# Inflation

**Scenario 1:** When AD increases and AS remains constant, prices rise. This type of inflation is somewhat acceptable b/c output will also increase.

# Inflation

Scenario 2: When AS decreases and AD remains constant, prices rise. This type of inflation results in a drop in output. This is referred to as stagflation.

# More on Inflation

Simultaneous changes in AD and AS can occur. This is the most realistic scenario. So the overall outcome is defined by the differences in the magnitude of the shifts.

Core inflation: Inflation rate after removing food prices and energy-related goods (due to volatility).

# Deflation

Deflation implies that prices drop. Deflation may trigger a recession or depression/financial crisis. Consumers put off purchases as they believe that prices will fall further. This leads to a downward spiral in prices and output.

AD decreases and AS remains constant

AS increases and AD remains constant

And simultaneous changes in which AS overwhelms AD

# Aggregate Demand

AD can be affected by changes in:

- Consumer spending
- Investment rates and returns
- Government spending
- Net export spending



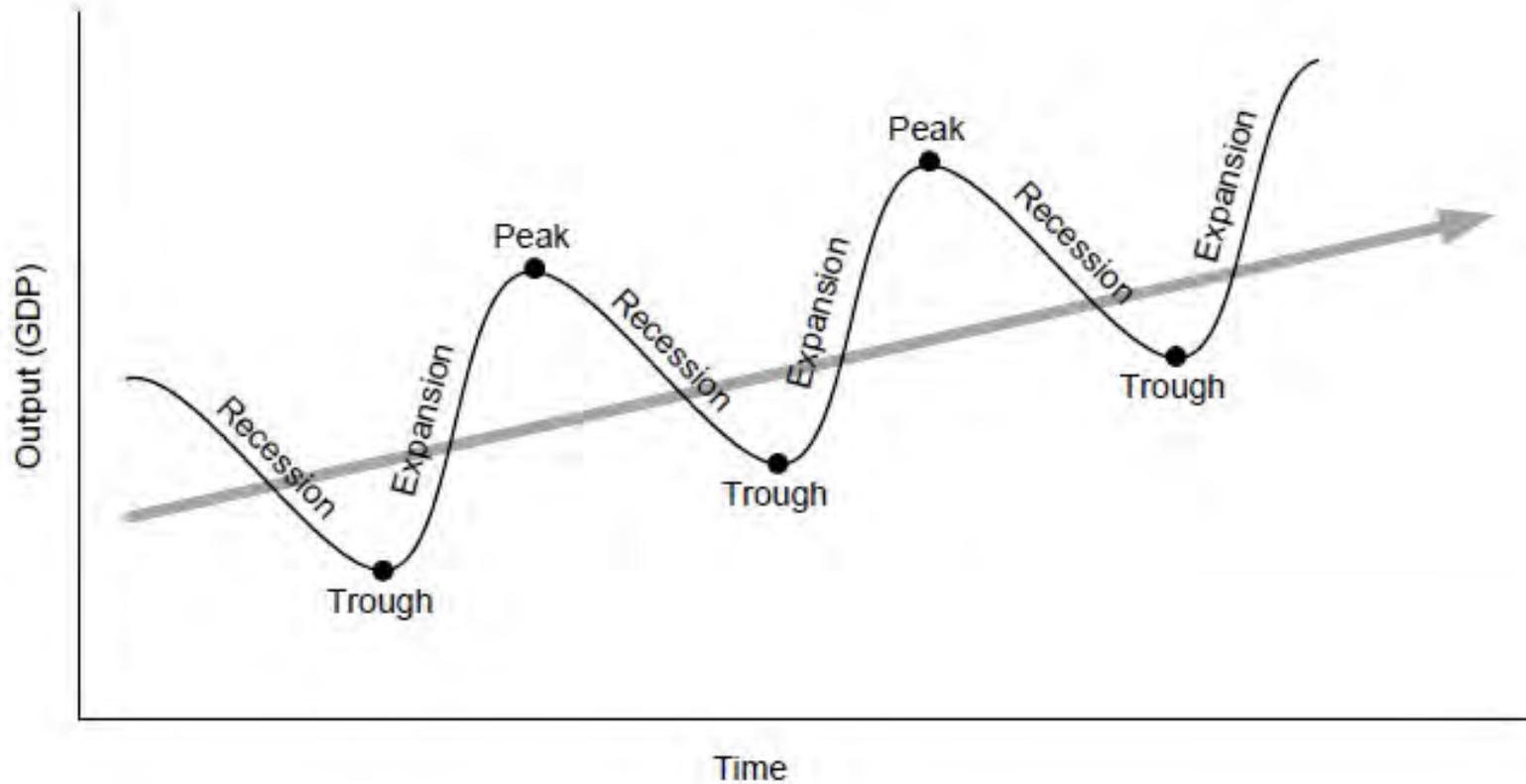
# Aggregate Supply

AS can be affected by changes in:

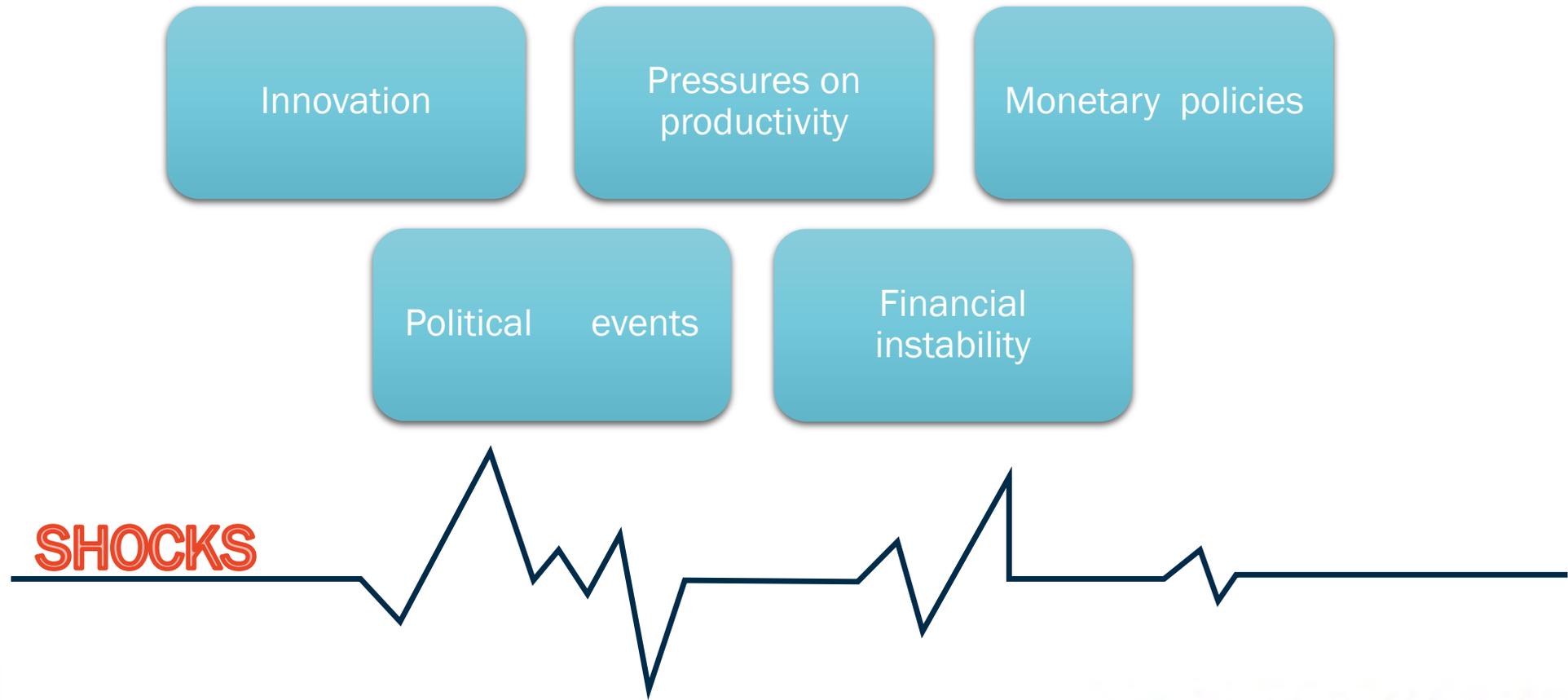
- Input prices
- Productivity
- Legal/regulatory



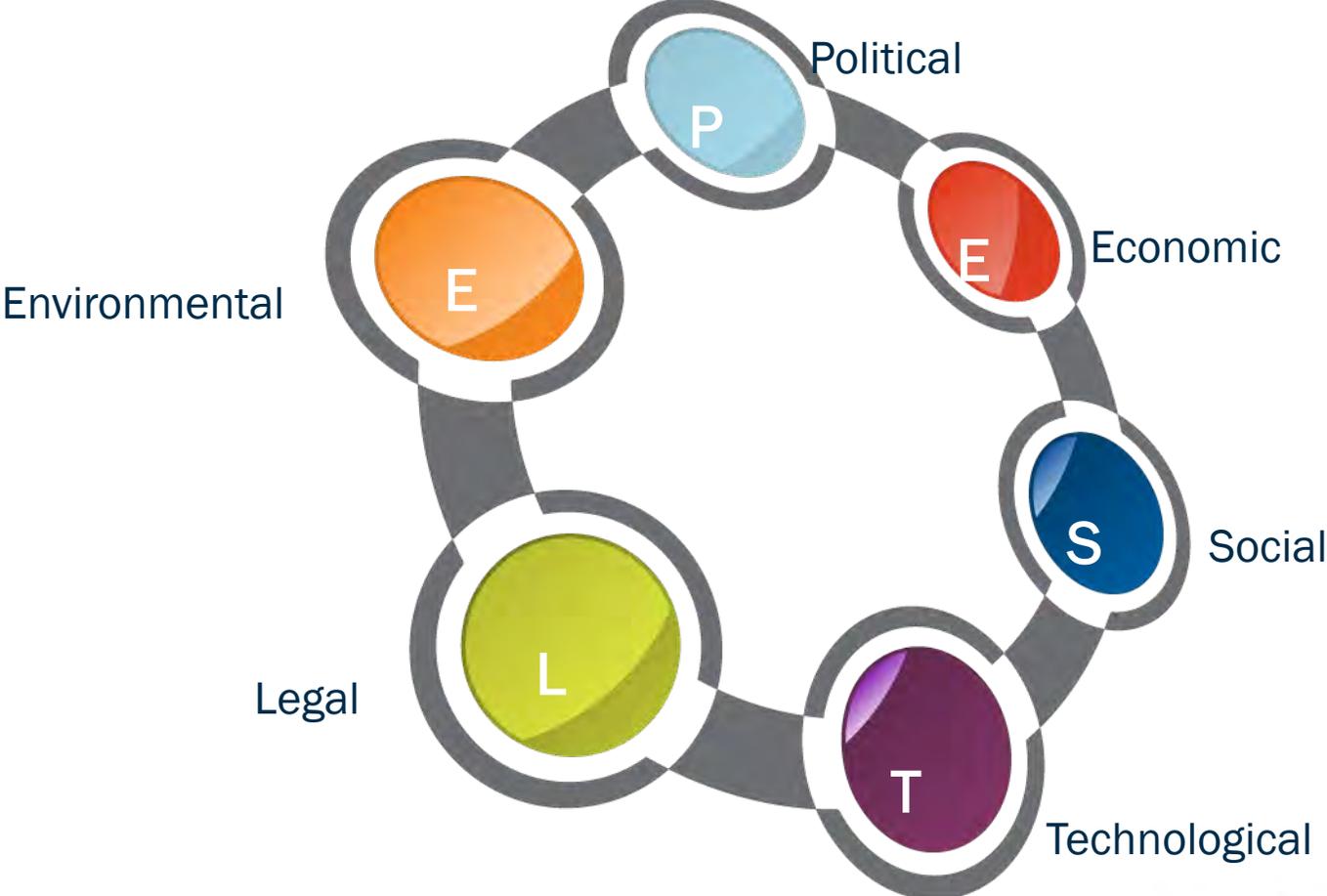
# Business Cycles



# Fluctuation Causes



# PESTLE Analysis



# Metrics: Political Indicators

## Governance

Traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies, and the respect of citizens and the state for the institutions that govern economic and social interactions among them.

## Performance Indicators:

Voice and accountability

Political stability and absence of violence

Government effectiveness

Regulatory quality

Rule of law

Control of corruption

# Metrics: Economic Indicators

## Consumer Price Index (CPI)

$$\text{CPI} = \frac{\text{Updated Cost}}{\text{Base Cost}} \times 100$$

# Other Economic Indicators

Consumer Confidence Index

Producer Price Index

# Metrics: Social Indicators

## Demographic data includes:

Population size and growth rate

Population distribution by age

Geographical distribution

Household size and makeup

Levels of education

Levels of health and access to health care

Rates for different types of crime, including violent and white-collar crime



# Metrics: Technological Indicators

Business investment in R&D

Government investment in R&D and policies that promote R&D

The number of technical degrees attained

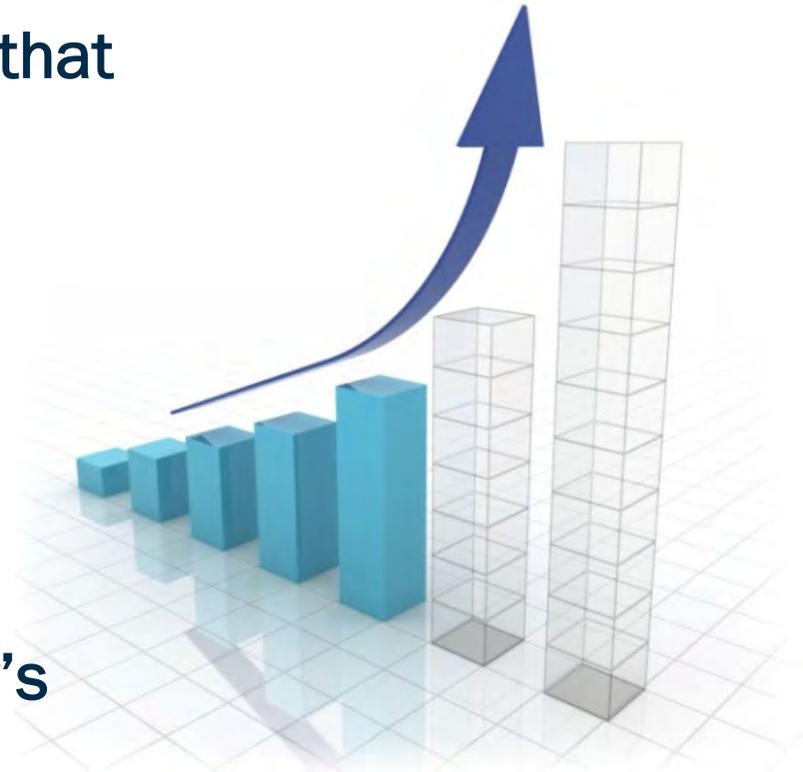
The number of patents awarded

Strength of intellectual property rights

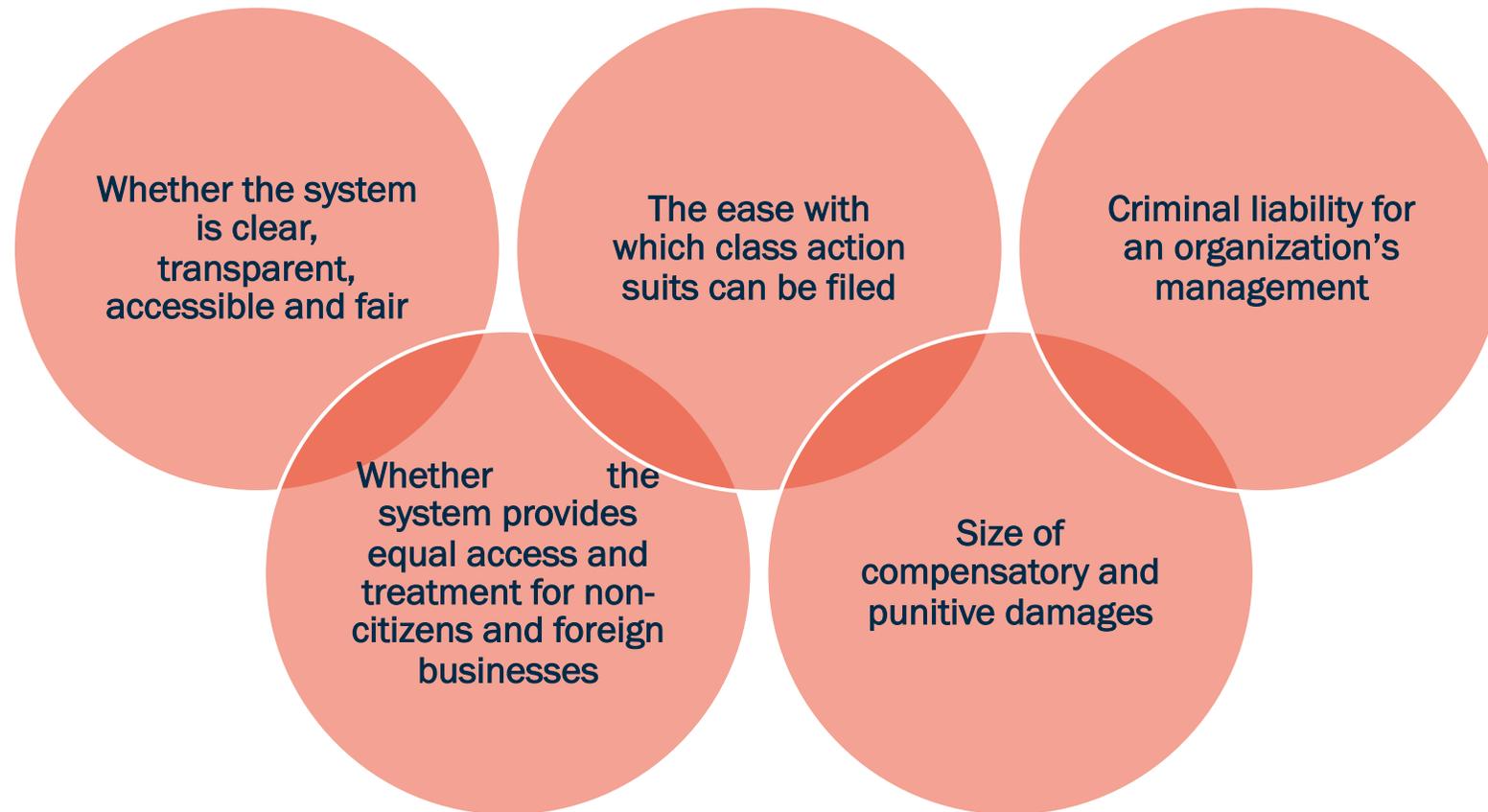
High-speed Internet access

Data security

Sophistication and resilience of the economy's energy grid



# Metrics: Legal Indicators



# Metrics: Environmental Indicators

## Sustainable practices include:

Practices to curb carbon consumption and emissions, such as carbon taxes and carbon offset markets

Regulations about water and land use and management of waste

Tax policies to promote renewable energy development and use



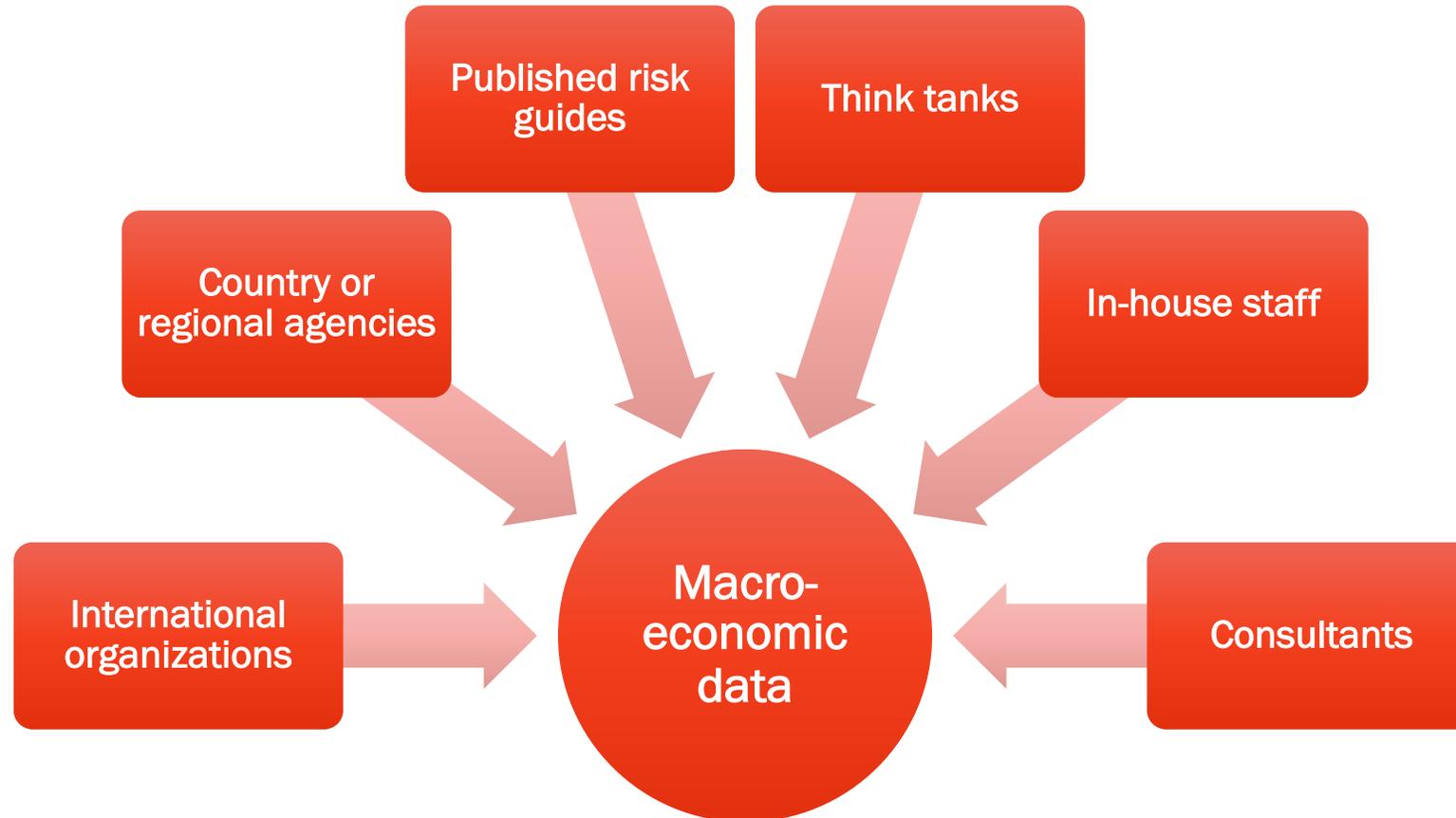
# Topic 3: Scanning for Environmental Risks

## Environmental Scanning

A systematic collection of external information in order to

- (1) lessen the randomness of information flowing into the organization and
- (2) provide early warnings for managers of changing external conditions.

# Topic 4: Source of Macroeconomic Information



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# **Part 1**

## **Domain A: Concepts of Business and Finance**

### **Chapter 7: Microeconomics**

# Microeconomics

## *Topics Overview*

- *Basic Terminology*
- *Laws of Supply and Demand*

# Basic Terminology

Supply and Demand  
Elasticity of Demand  
Scarcity  
Pricing  
Rationing  
Opportunity Cost  
Substitution Effect  
Sunk Costs  
Marginal Costs

Marginal Utility  
Marginal Analysis  
Economies of Scale  
Diminishing Returns  
Competitive Markets  
Monopoly

# Law of Demand

For normal goods, there is an inverse relationship between price and the quantity of a good or service demanded.

**Factors that shift the demand curve: consumer preferences, number of buyers, consumer incomes, prices and availability of substitutes, prices of complementary goods, consumer *expectations*.**

- Caution: A change in price does not shift the demand curve; it's a movement along the existing demand curve.

# Law of Supply

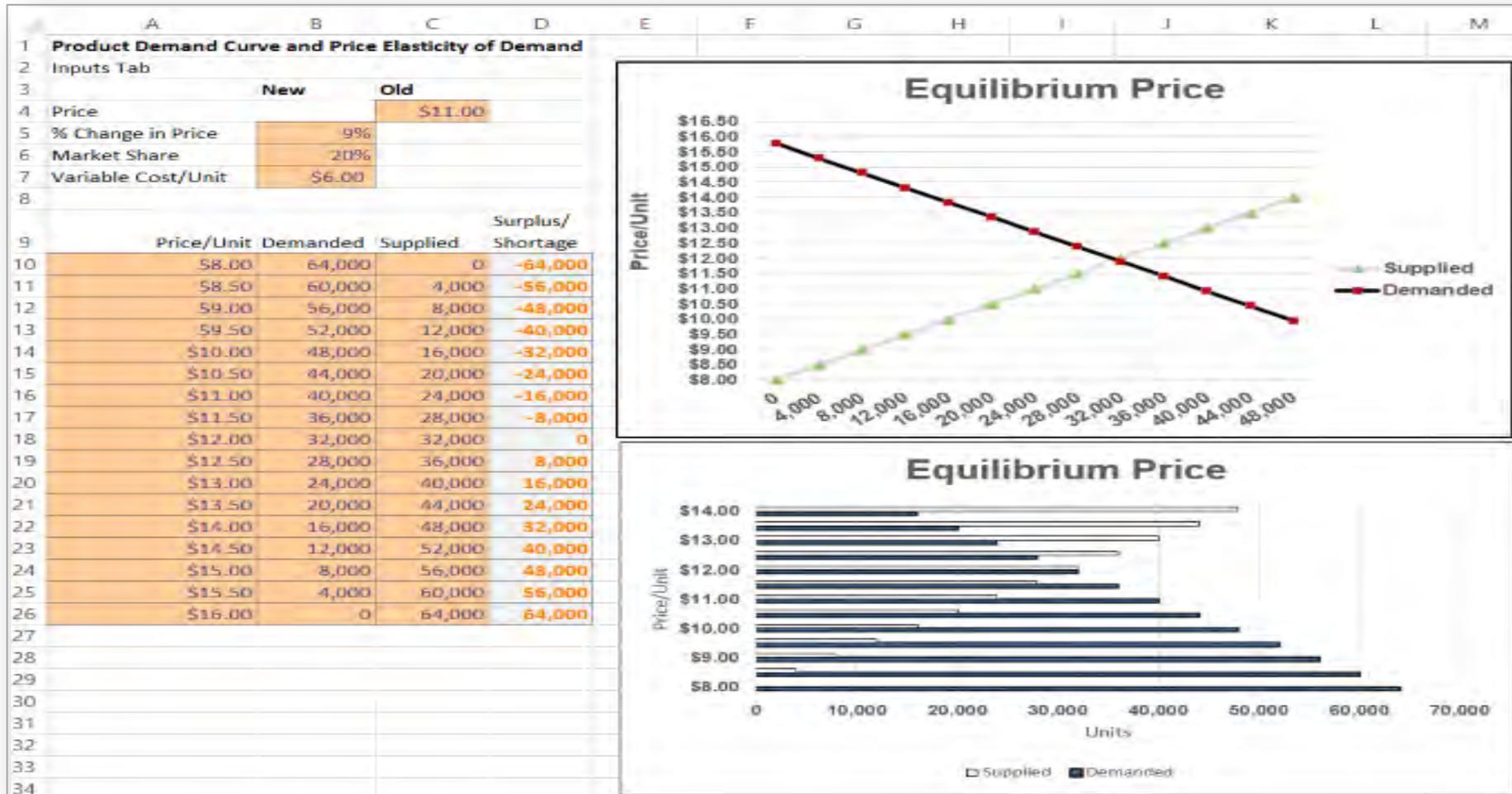
For normal goods, there is a positive relationship between price and the quantity of a good or service supplied.

Factors that shift the supply curve: number of competitors, prices for raw materials and resources, subsidies and taxes, prices of production substitutes, producer *expectations*.

# Adding Context to the Analysis of Supply and Demand

- Competitor analysis
- Industry concentration/competitiveness
- Distribution of market share

# Graphical Analysis



# Basics of Price Elasticity

How does the consumer react to a price change?

In general, an increase in price will result in a lower QD. For the firm, the issue involves the relative tradeoff between higher price and lower volume.

- Revenue =  $P * QD$
- Does the lower QD offset the higher \$P?

The following slide provides a contribution margin application to price elasticity.

## Old Pricing Strategy

Price = \$11

Variable Cost = \$6

Quantity Sold = 8,000

Revenue = \$88,000

Variable Costs = \$48,000

Contribution Margin = \$40,000

## New Pricing Strategy

Price = \$11.99

Variable Cost = \$6

Quantity Sold = 7,200

Revenue = \$86,325

Variable Costs = \$43,200

Contribution Margin = \$43,128

Despite the lower quantity sold, the increase in price resulted in a higher contribution margin.

# Price Elasticity of Demand

For some...

A small change in price creates a large change in demand.

For others...

A small change in price will have only a small change in demand.

$$E_d = \frac{\frac{|\text{Change in Quantity}|}{\text{Sum of Quantities} \div 2}}{\frac{|\text{Change in Price}|}{\text{Sum of Prices} \div 2}}$$

# Price Elasticity Example

Quantity Demanded	Price per Unit
40,000	\$11.00
36,000	\$11.50
32,000	\$12.00

What is the price elasticity of demand for this product if the firm increases price from \$11.00 to \$11.99?

# Price Elasticity Example

Quantity Demanded	Price per Unit
40,000	\$11.00
36,000	\$11.50
32,000	\$12.00

What is the price elasticity of demand for this product if the firm increases price from \$11.00 to \$11.99?

$$\text{Price Elasticity} = \frac{\frac{8,000}{\left(\frac{40,000+32,000}{2}\right)}}{\frac{\$0.99}{\left(\frac{\$11.00+\$11.99}{2}\right)}} = \frac{0.222}{0.086} = 2.581$$

# Interpreting Elasticity Coefficient

## If Elasticity Coefficient is

- > 1, then demand is elastic
- < 1, then demand is inelastic
- = 1, then demand is unitary elastic
- = 0, then demand is perfectly inelastic

	Elasticity Coefficient > 1	Elasticity Coefficient < 1	Elasticity Coefficient = 1
Price increases	Total Revenue drops	Total Revenue increases	No change
Price decreases	Total Revenue increases	Total Revenue decreases	No change

# Factors Affecting Demand Elasticity

## Luxury vs. Necessity

- Goods or services that are “must haves” are generally less price elastic (i.e., more inelastic).
- Discretionary goods or services are generally more price elastic.

## Relative Price

- Low priced items tend to have lower price elasticity, and the opposite is true for more expensive items.

## Short-term versus Long-term

- Demand is more elastic in long-term.

# Elasticity of Supply

$$\text{Price Elasticity of Supply} = \frac{\text{Percentage Change in Quantity Supplied}}{\text{Percentage Change in Price for a Product}}$$

# Part 1

## Domain B: Systems and Technology

### Chapter 8: Using Worksheets and Worksheet Functions

# Using Worksheets and Worksheet Functions

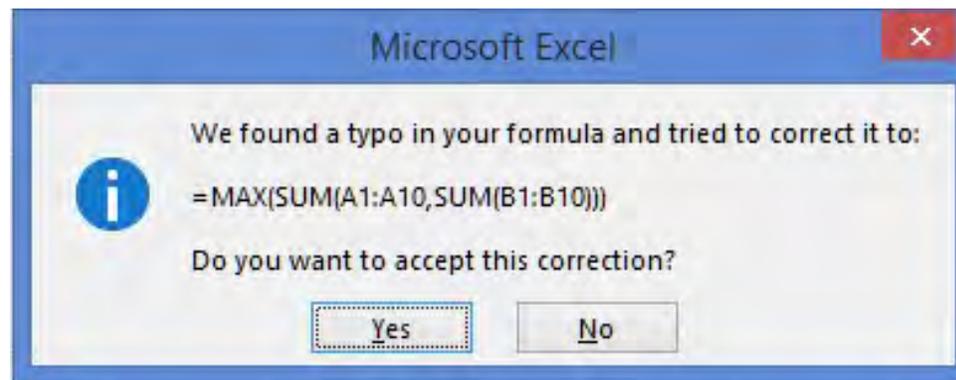
## *Topics Overview*

- *Review Basic Worksheet Functions*
- *Create Documentation within a Worksheet*
- *Perform Worksheet Validation and Error Prevention and Checking*
- *Create Charts*
- *Use Value Lookups, MATCH, OFFSET and List Validate*
- *Use Pivot Tables*
- *Perform Financial Functions and Create Financial Models*
- *Create Macros and User Forms*
- *Share/Link Workbooks and Import/Export Data*

# Order of Operations and Proper Use of Parentheses

=MAX(SUM(A1:A10,SUM(B1:B10))

**ERROR**



# IF, MIN, MAX, COUNTIF and SUMIF

'IC Sales' Tab  
(Inputs)

	A	B	C
1	<b>Ice Cream</b>	<b>Quantity</b>	
2	Chocolate	2	pallets
3	Vanilla	1	pallets
4	Vanilla	3	pallets
5	Strawberry	1	pallets
6	Vanilla	4	pallets
7	Strawberry	4	pallets
8	Chocolate	5	pallets
9	Chocolate	4	pallets

Calculations

	A	B	C
1	<b>Countif</b>		
2	Chocolate	3	buyers
3	Quantity >3	4	buyers
4			
5	<b>Sumif</b>		
6	Chocolate	11	pallets
7	Quantity >3	17	pallets

Calculations with Show Formulas Turned On

	A	B	C
1	<b>Countif</b>		
2	Chocolate	=COUNTIF('IC Sales'!A2:A9, 'IC Sales'!A2)	buyers
3	Quantity >3	=COUNTIF('IC Sales'!B2:B9, ">3")	buyers
4			
5	<b>Sumif</b>		
6	Chocolate	=SUMIF('IC Sales'!A2:A9, 'IC Sales'!A2, 'IC Sales'!B2:B9)	pallets
7	Quantity >3	=SUMIF('IC Sales'!B2:B9, ">3")	pallets

# Nested IF Statements

**Step 1: Basic IF Statement**

Formula: `=IF(A8>=B3, C4, C3)`

Start by building a basic IF statement and once working, build the other IF statement in a separate cell and get it working too.

**Step 2: Nested IF Statement**

Formula: `=IF(A8<=B4, C4, C5)`

Then copy the Nested IF without the equal sign, press Enter to leave the cell, then highlight the argument to replace (value if true in this example) and paste the nested IF in its place.

**Step 3: Final Nested IF Statement**

Formula: `=IF(A8>=B3, IF(A8<=B4, C4, C5), C3)`

Once various values have been tested, delete the formula in the temporary cell.

Bulk Pricing Table		
Min Vol	Max Vol	Item Price
-	100	30
101	200	25
201	-	20

Quantity	Item Price	Total Price
201	<code>=IF(A8&gt;=B3, C4, C3)</code>	<code>=A8*B8</code>

Quantity	Item Price	Total Price
201	\$20	\$4,020

# Table with Summary Row

	A	B	C	D	E	F
1	Period	Actual	Forecast	Variance	F or U	Difference
2	Jan	350	400	50	U	-50
3	Feb	375	400	25	U	-25
4	Mar	425	500	75	U	-75
5	Apr	505	500	5	F	5
6	May	540	550	10	U	-10
7	Jun	604	550	54	F	54
8	Jul	580	600	20	U	-20
9	Aug	560	600	40	U	-40
10	Sep	543	500	43	F	43
11	Oct	464	500	36	U	-36
12	Nov	434	400	34	F	34
13	Dec	380	400	20	U	-20
14	<b>Total</b>	<b>5,760</b>	<b>5,900</b>	<b>19.88</b>	<b>-</b>	<b>-140</b>
15				None		
16				Average		
17				Count		
18				Count Numbers		
19				Max		
20				Min		
21				Sum		
				StdDev		
				Var		
				More Functions...		

Referencing the Table, Showing AutoComplete Options

=SUM(Table2[

SUM(number1, [number2], ...)

- Period
- Actual
- Forecast
- Variance
- F or U
- Difference
- #All
- #Data
- #Headers
- #Totals
- @ - This Row

SUM

SUM doesn't make sense for these variances, so the standard deviation is selected.

SUM

To select a particular row

# Creating Arrays and Array Formulas

Using an array rather than a series of formulae:

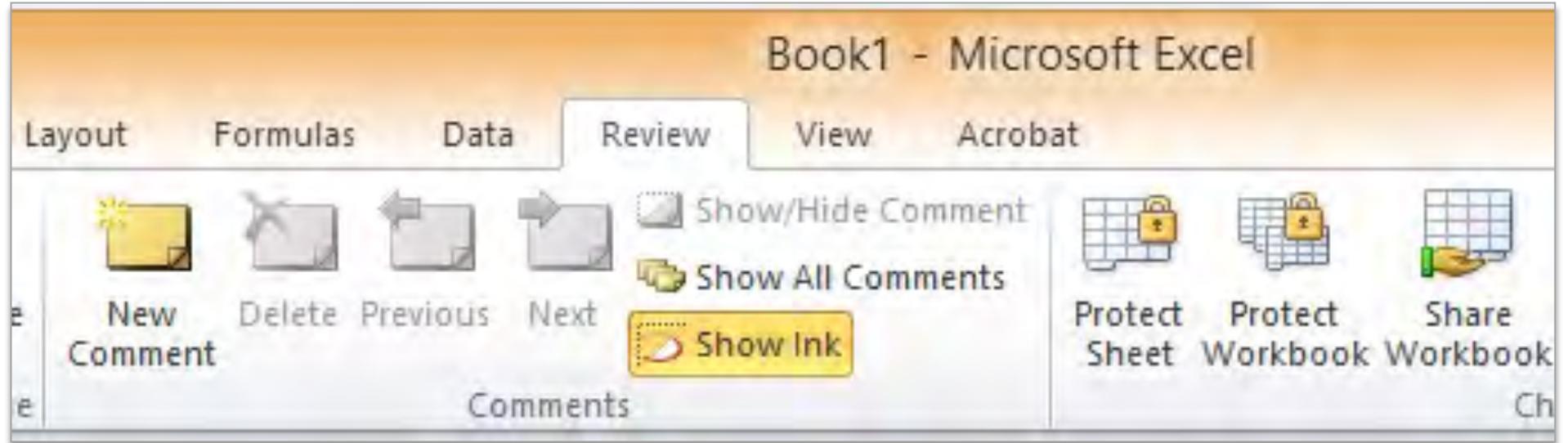
- To ensure that all calculations are identical
- To reduce the chances that a complex formula is in error
- To prevent overwriting or tampering with one or more formulae in the range
- To prevent addition or deletion of rows or columns occupied by the array range when this could affect other calculations, etc.

# Multicell Arrays

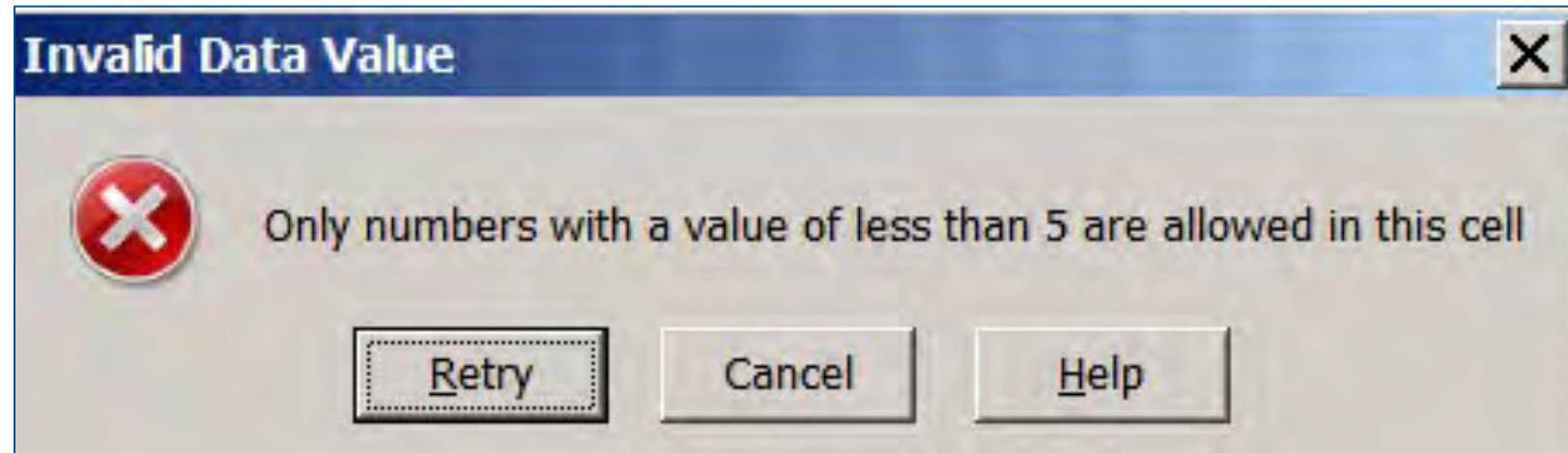
H2      fx    {=(B2:B13+C2:C13)/C2:C13} ← Multicell Array

	A	B	C	D	E	F	G	H
1	Period	Actual	Forecast	Variance	F or U	Difference		
2	Jan	350	400	50	U	-50		1.88
3	Feb	375	400	25	U	-25		1.94
4	Mar	425	500	75	U	-75		1.85
5	Apr	505	500	5	F	5		2.01
6	May	540	550	10	U	-10		1.98
7	Jun	604	550	54	F	54		2.10
8	Jul	580	600	20	U	-20		1.97
9	Aug	560	600	40	U	-40		1.93
10	Sep	543	500	43	F	43		2.09
11	Oct	464	500	36	U	-36		1.93
12	Nov	434	400	34	F	34		2.09
13	Dec	380	400	20	U	-20		1.95
14	<b>Total</b>	<b>5,760</b>	<b>5,900</b>	<b>19.88</b>		<b>-140</b>		

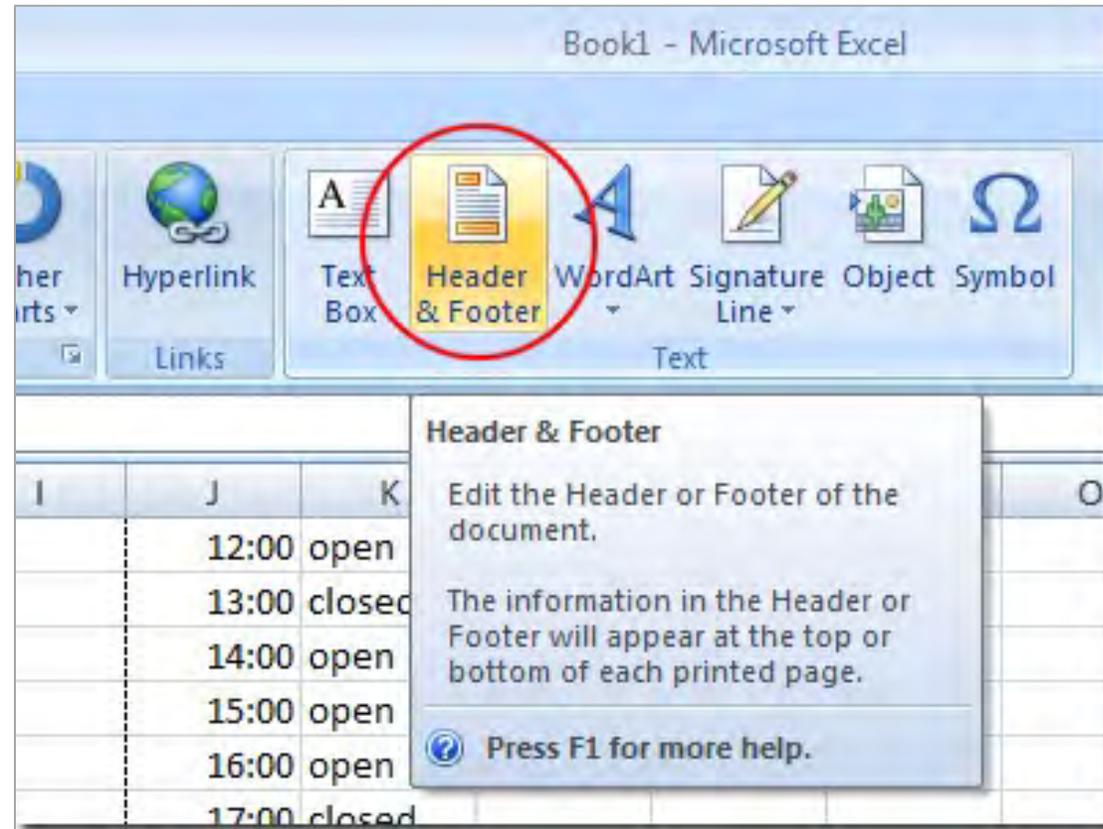
# In-Cell Comments



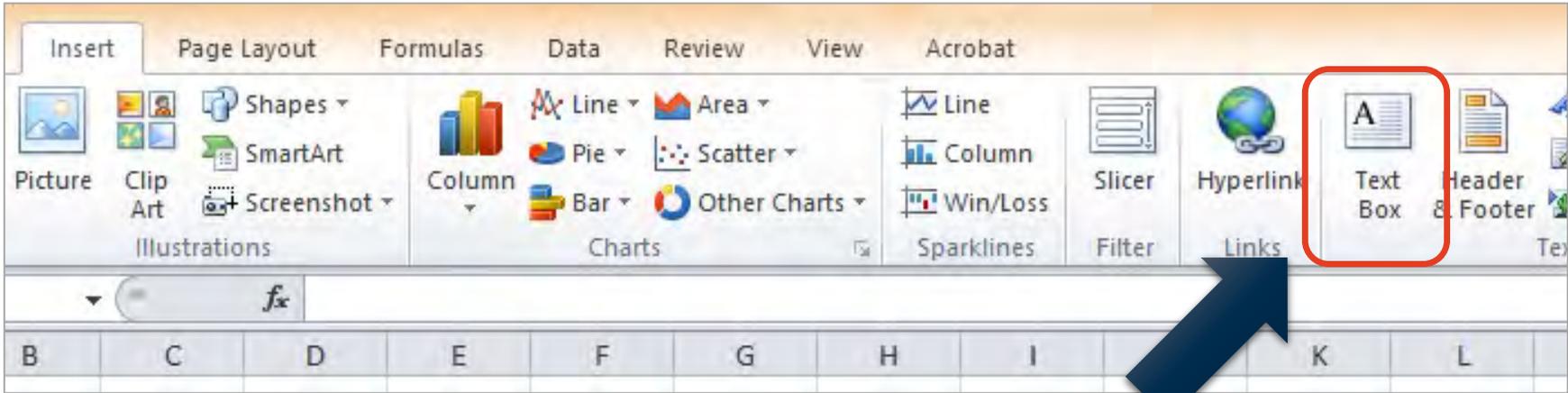
# Data Validation Input Messages



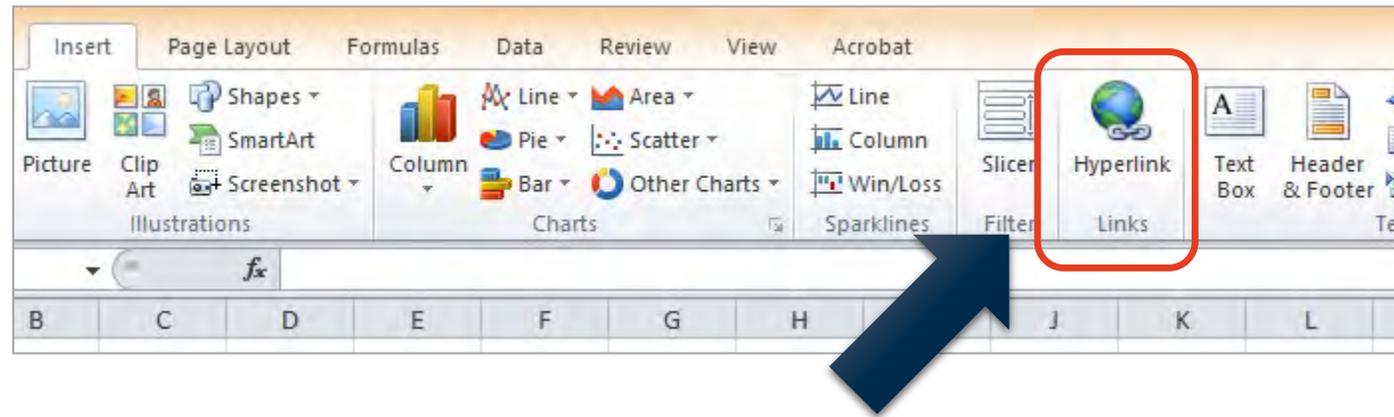
# Headers and Footers



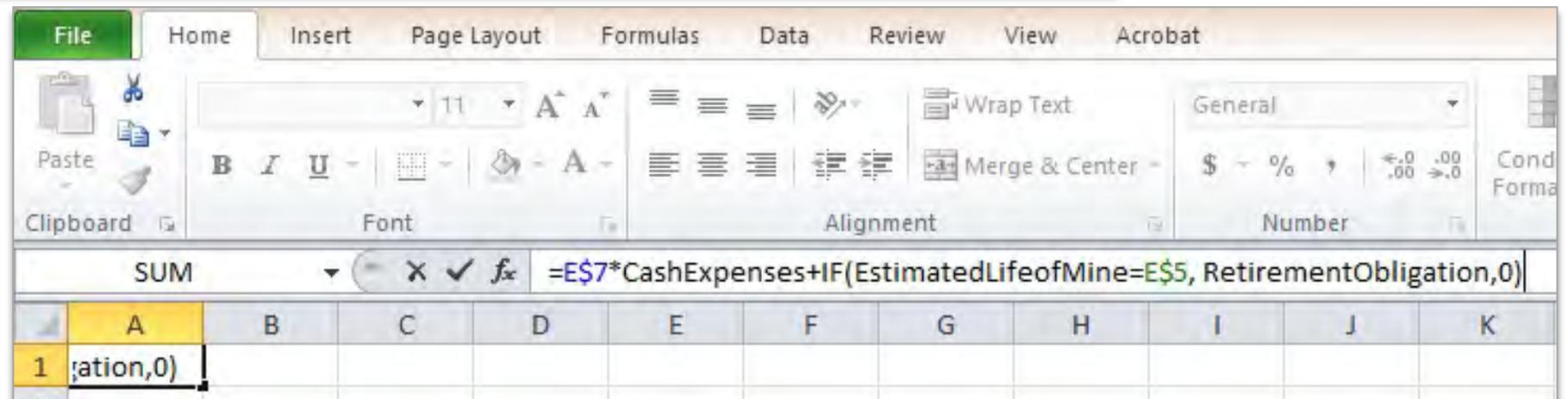
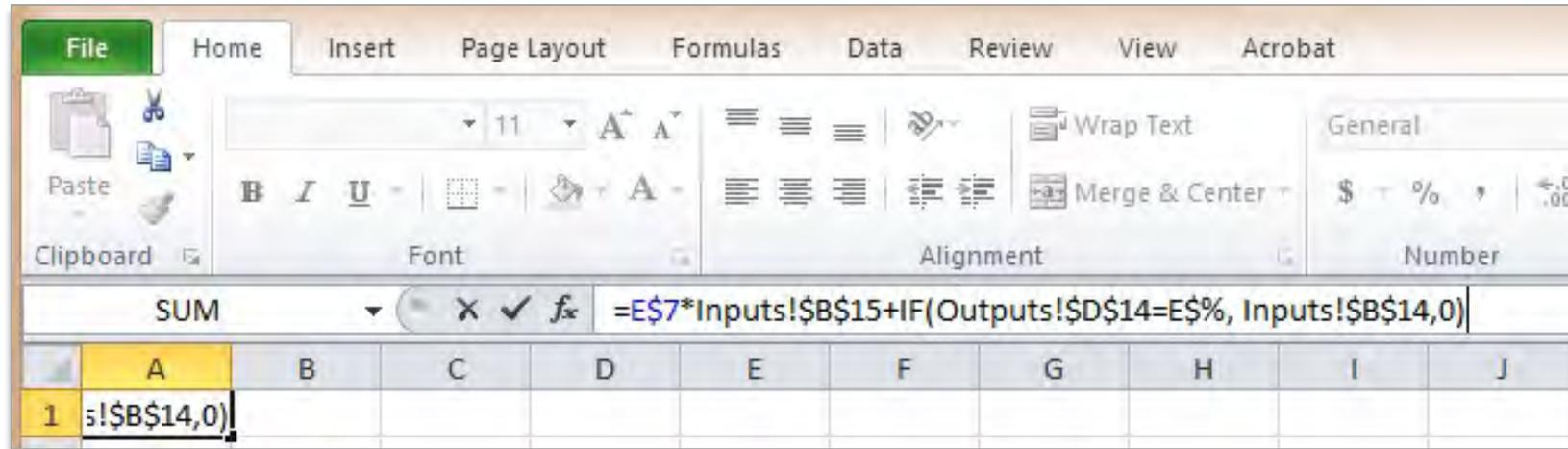
# Text Boxes



# Hyperlinks



# Using Named Cells, Ranges, Constants, Tables or Worksheet Tabs



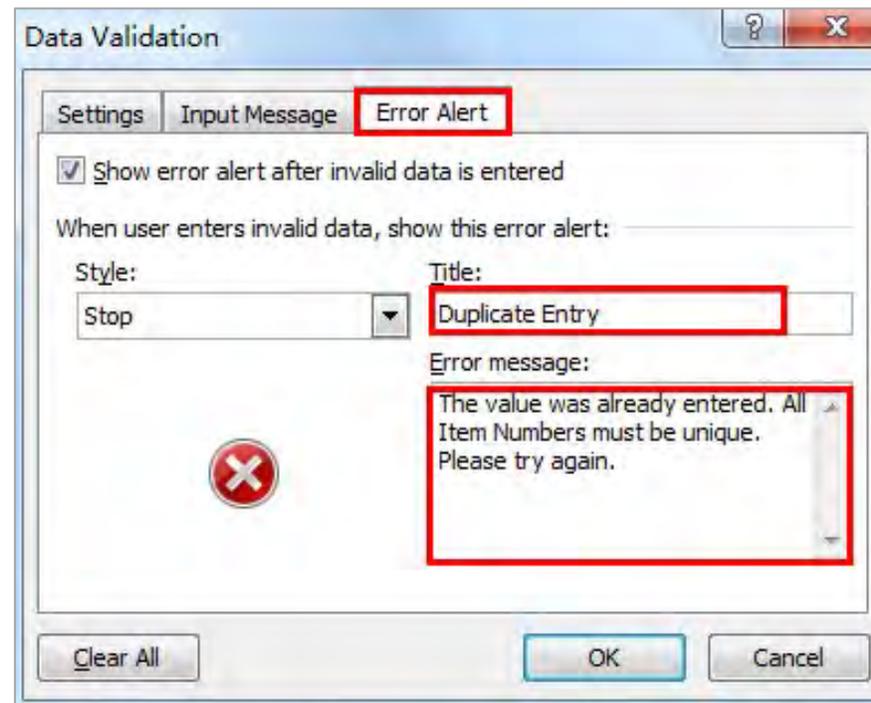
# Develop an Error-Checking Process

## Forms of error checking

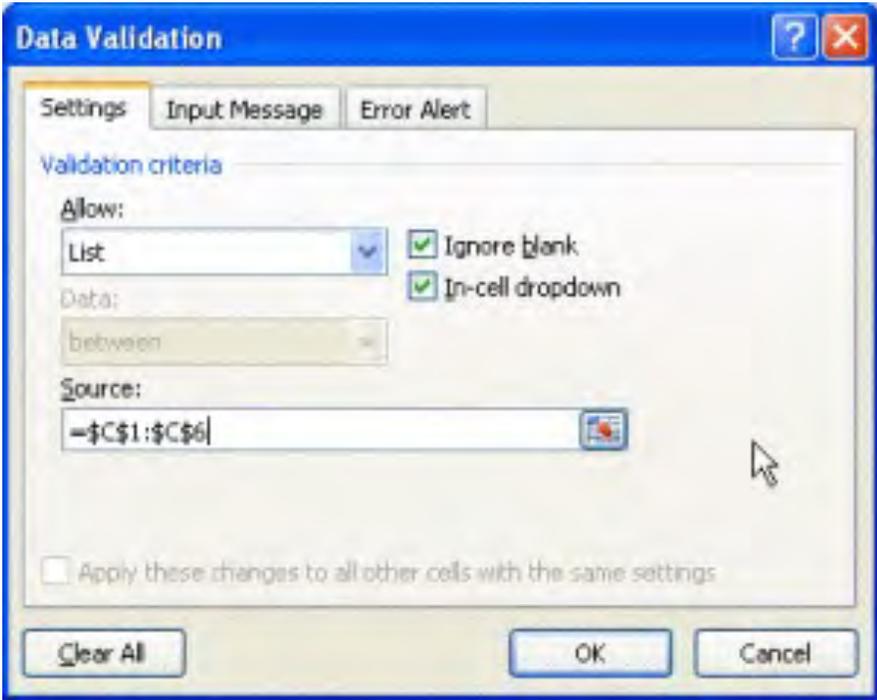
- Conceptual logic
- Input errors
- Formulaic errors
- Output errors



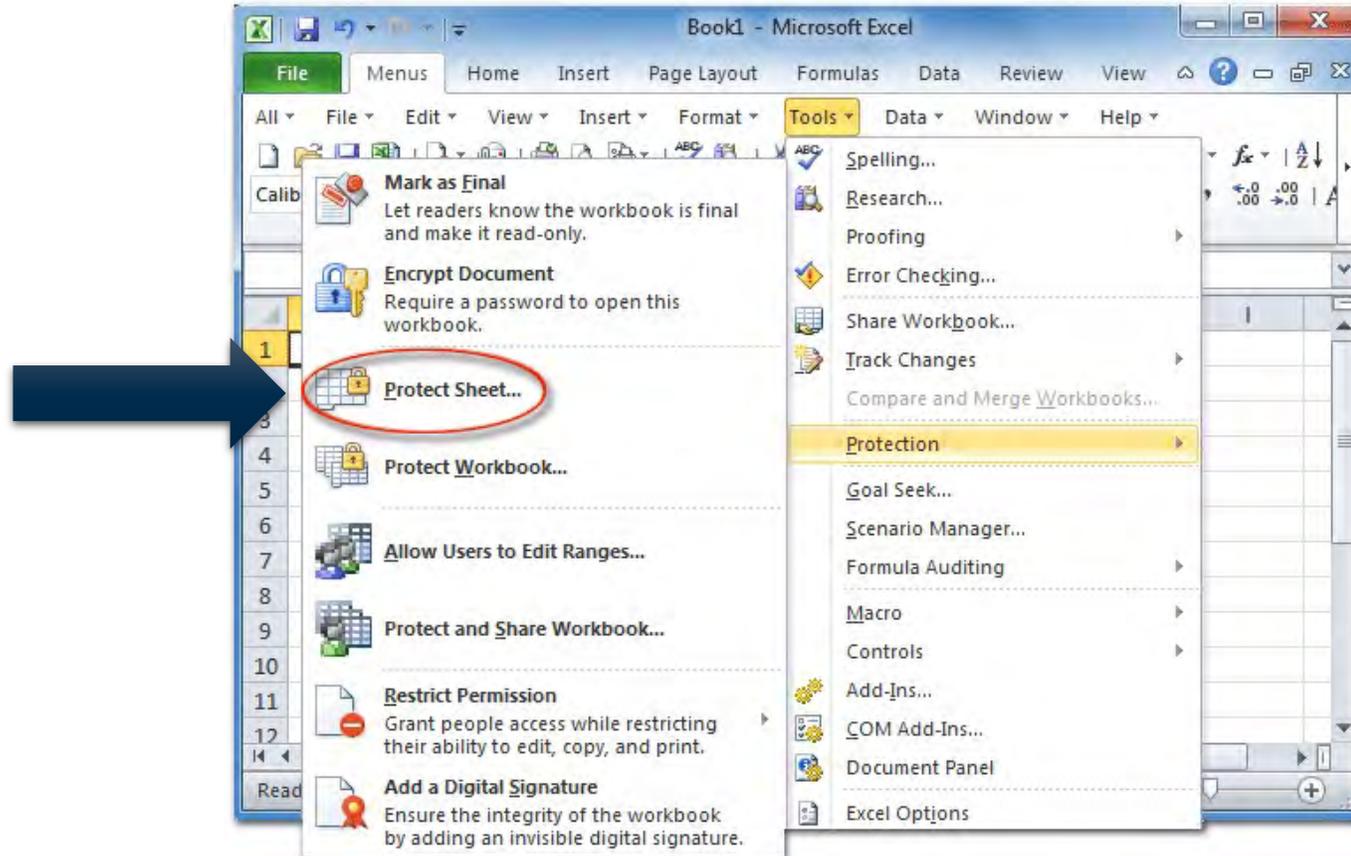
# Prevent Errors from Occurring



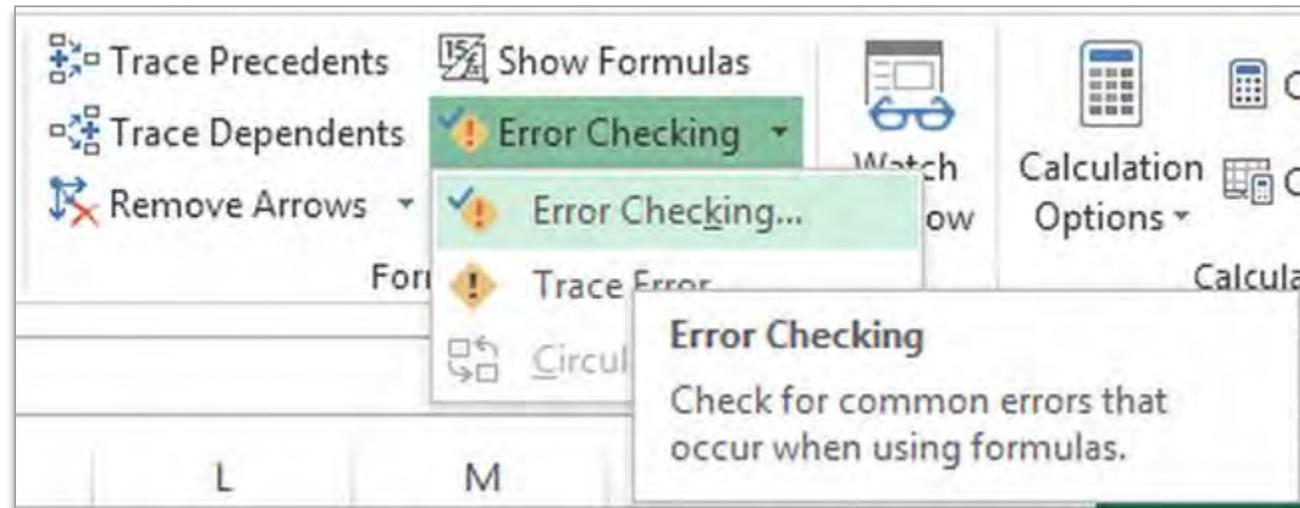
# Validate Data



# Format Worksheet to Restrict Potential Inputs



# Use Tools to Check for Errors and Exceptions



# Check Sums

Simple Subtraction				Equal Logic Test				If Statement (Testing Not Equal)				
C16 = -C14-C10				C16 = C14=C10				C16 = IF(C10<>C14, "ERROR", "OK")				
A	B	C	D	A	B	C	D	A	B	C	D	E
1	Inventory			1	Inventory			1	Inventory			
2	Flavor	Type	Inventory	2	Flavor	Type	Inventory	2	Flavor	Type	Inventory	
3	Chocolate	Regular	50	3	Chocolate	Regular	50	3	Chocolate	Regular	50	
4	Chocolate	Light	30	4	Chocolate	Light	30	4	Chocolate	Light	30	
5	Strawberry	Regular	40	5	Strawberry	Regular	40	5	Strawberry	Regulaar	40	← Error (Typo)
6	Strawberry	Light	20	6	Strawberry	Light	20	6	Strawberry	Light	20	
7	Vanilla	Regular	60	7	Vanilla	Regular	60	7	Vanilla	Regular	60	
8	Vanilla	Light	40	8	Vanilla	Light	40	8	Vanilla	Light	40	
9				9				9				
10			240	10			240	10			240	
11				11				11				
12		Regular	150	12		Regular	150	12		Regular	110	
13		Light	90	13		Light	90	13		Light	90	
14			240	14			240	14			200	
15				15				15				
16	Check Sum		0	16	Check Sum		TRUE	16	Check Sum		ERROR	

# Error Tolerance

An absolute value formula can be designed with a specification of how much error to tolerate:

```
=IF(ABS(C10-C14)>0.1,"ERROR","OK")
```

# Conditional Formatting

The screenshot shows an Excel spreadsheet with the following data:

1	Inventory		
2	Flavor	Type	Inventory
3	Chocolate	Regular	50
4	Chocolate	Light	30
5	Strawberry	Regulaar	40
6	Strawberry	Light	20
7	Vanilla	Regular	60
8	Vanilla	Light	40
9			
10			240
11			
12		Regular	110
13		Light	90
14			200
15			
16	Check Sum		ERROR

The formula bar for cell C16 shows: `=IF(C10<>C14, "ERROR", "OK")`

The 'Text That Contains' dialog box is open, showing the text 'ERROR' and the format 'Light Red Fill with Dark Red Text'.

# Use Auditing Tools

## Auditing tools include:

- Go to special
- Show formulas
- Trace precedents and dependents
- Trace error values
- Evaluate formula

<b>Statement of Cash Flows</b>			
<b>ShopNow!</b>			
<i>Indirect Method</i>			
<i>(Millions)</i>			
<b>For the Years Ended December 31,</b>			
	<b>2012</b>	<b>2013</b>	<b>Source</b>
<b>Cash flows from Operating Activities</b>			
Net Income	\$1,340	\$2,910	Income Statement
<i>Adjustments to Reconcile Net Income to Net Cash Flow</i>			
<b>Noncash Adjustments</b>			
+ Depreciation and Amortization	\$1,207	\$1,510	Income Statement
<b>Changes in Working Capital</b>			
Decrease (Increase) in A/R	(\$75)	(\$999)	-Δ Balance Sheet
Decrease (Increase) in Inventory	(700)	(1,476)	-Δ Balance Sheet
Decrease (Increase) in Other Current Assets	(1,401)	699	-Δ Balance Sheet
Increase (Decrease) in A/P	1,236	1,483	Δ Balance Sheet
Increase (Decrease) in Accrued Expenses	26	543	Δ Balance Sheet
Increase (Decrease) in Income Taxes and Other	1,040	(963)	Δ Balance Sheet
<b>Net Cash Flow From Operating Activities</b>	<b>\$2,673</b>	<b>\$3,707</b>	
<b>Cash flows from Investing Activities</b>			
CapEx Spend	(\$3,026)	(\$4,858)	-Δ Balance Sheet
<b>Changes in LT Assets &amp; Liabilities</b>			
Decrease (Increase) in Other Noncurrent Assets	(\$418)	(\$171)	-Δ Balance Sheet
Increase (Decrease) in Deferred Income Taxes and Other	691	416	Δ Balance Sheet
<b>Net Cash Flow from Investing Activities</b>	<b>(\$2,753)</b>	<b>(\$4,613)</b>	
<b>Cash flows from Financing Activities</b>			
Increase (Decrease) in Long-Term Debt [Source (Use) of Cash]	\$3,163	\$4,448	Δ Balance Sheet
Less Dividends Paid	(250)	(250)	Inputs
<b>Net Cash Flow from Financing Activities</b>	<b>\$2,913</b>	<b>\$4,198</b>	
<b>Summary</b>			
Beginning Cash	\$682	\$3,515	PY Balance Sheet Cash
Ending Cash	<b>3,515</b>	<b>6,807</b>	
Minimum Cash Balance	250	250	Inputs
Excess (Required) Cash	<b>\$3,265</b>	<b>\$6,557</b>	
Ending Cash vs. Cash on Balance Sheet Check	\$3,515	\$6,807	
Check Sum	OK	OK	

# Go to Special

D19    =PERCENTRANK.INC(\$D\$14:D\$14,0,6)\*D\$5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Panama Mine Purchase Analysis Model														
2	Workings Tab														
3	Estimated Annual Cash Flows (US\$ millions except Copper Price per MT)														
4	Year			31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18						
5	Project Year			0	1	2	3	4	5						
6	Copper Price per MT			\$8,000	\$8,390	\$8,799	\$9,228	\$9,678	\$10,150						
7	Revenue			\$0.0	\$188.8	\$198.0	\$207.6	\$217.8	\$228.4						
8	Cash Expenses			\$600.0	\$75.5	\$79.2	\$83.1	\$87.1	\$91.3						
9	Depreciation Expenses			\$0.0	\$21.6	\$21.6	\$21.6	\$21.6	\$21.6						
10	Income Before Tax			(\$600.0)	\$91.7	\$97.2	\$103.0	\$109.1	\$115.4						
11	Income Taxes			\$0.0	\$36.7	\$38.9	\$41.2	\$43.6	\$46.2						
12	Income After Tax			(\$600.0)	\$55.0	\$58.3	\$61.8	\$65.4	\$69.3						
13	After Tax Cash Flow			(\$600.0)	\$76.6	\$79.9	\$83.4	\$87.0	\$90.9						
14	Cumulative CF			(\$600.0)	(\$523.4)	(\$443.5)	(\$360.1)	(\$273.1)	(\$182.2)						
15	Discounted CF			(\$600.0)	\$69.6	\$66.0	\$62.6	\$59.4	\$56.4						
16	Cumulative Discounted CF			(\$600.0)	(\$530.4)	(\$464.3)	(\$401.7)	(\$342.2)	(\$285.8)						
17	NPV if Final Year				(\$530.4)	(\$464.3)	(\$401.7)	(\$342.2)	(\$285.8)						
18	IRR if Final Year				-87.2%	-56.6%	-34.5%	-20.2%	-10.7%	-4.2%	0.5%	3.9%	6.4%	8.4%	9.9%
19	Payback Period			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	6.9	6.9	6.9	6.9
20	Discounted Payback Period			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

19	Payback Period			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	6.9	6.9	6.9
20	Discounted Payback Period			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Go To Special

Select

- Comments
- Constants
- Formulas
  - Numbers
  - Text
  - Logicals
  - Errors
- Blanks
- Current region
- Current array
- Objects
- Row differences
- Column differences
- Precedents
- Dependents
  - Direct only
  - All levels
- Last cell
- Visible cells only
- Conditional formats
- Data validation
- All
- Same

OK    Cancel

# Show Formulas

	A	B	C
1	<b>Countif</b>		
2	Chocolate	<code>=COUNTIF('IC Sales'!A2:A9, 'IC Sales'!A2)</code>	buyers
3	Quantity >3	<code>=COUNTIF('IC Sales'!B2:B9, "&gt;3")</code>	buyers
4			
5	<b>Sumif</b>		
6	Chocolate	<code>=SUMIF('IC Sales'!A2:A9, 'IC Sales'!A2, 'IC Sales'!B2:B9)</code>	pallets
7	Quantity >3	<code>=SUMIF('IC Sales'!B2:B9, "&gt;3")</code>	pallets

# Create Value Lookups

=VLOOKUP(\$D\$2,Table,COLUMN(B1),FALSE)			
D	E	F	G
Part	Price	Part #	Supplier
Widget	\$14.76	PN-98769	Widgets Inc.
Part	Price	Part #	Supplier
Bearing	\$14.76	PN-34534	The B & G Co.
Gear	\$23.56	PN-24123	The B & G Co.
Widget	\$14.76	PN-98769	Widgets Inc.
Cog	\$20.21	PN-34241	The Cog Shop
Bolt	\$1.54	PN-65453	The Bolt Store
Washer	\$1.43	PN-87698	Widgets Inc.

# Create HLOOKUPS

B7		$\mathcal{L}$	=HLOOKUP(B6, B2:G4, 3)				
	A	B	C	D	E	F	G
1	<b>Total Sale is Between</b>						
2	<b>Lower Price</b>	\$0	\$1,001	\$2,501	\$5,001	\$7,501	\$10,001
3	<b>Upper Price</b>	\$1,000	\$2,500	\$5,000	\$7,500	\$10,000	
4	<b>Discount to Apply</b>	0%	2%	3%	4%	5%	6%
5							
6	<b>Enter Total Sale</b>	\$3,100.00					
7	<b>Discount</b>	3%					
8	<b>Net Sale</b>	\$3,007.00					

Annotations: An arrow points from the number '3' in the formula bar to the 3rd row of the table (row 3). Another arrow points from the 3rd column header (C) to the 3rd row of the table (row 3). A third arrow points from the 3rd row of the table (row 3) to the text '3<sup>rd</sup> Row from Start of Range'.

# Process of Developing Pivot Tables

	A	B	C	D	E	F	G	H	I	J
1	<b>Country</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Q1</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Q2</b>	<b>Total</b>
2	France	\$2,243	\$2,432	\$2,503	\$7,178	\$2,488	\$3,055	\$3,342	\$8,885	\$16,063
3	Germany	\$2,454	\$2,498	\$2,072	\$7,024	\$2,699	\$3,264	\$3,183	\$9,146	\$16,170
4	Spain	\$2,843	\$3,923	\$3,243	\$10,009	\$3,285	\$2,288	\$2,288	\$7,861	\$17,870
5	Portugal	\$2,632	\$2,634	\$2,083	\$7,349	\$2,256	\$2,555	\$2,732	\$7,543	\$14,892
6	<b>Europe</b>	<b>\$10,172</b>	<b>\$11,487</b>	<b>\$9,901</b>	<b>\$31,560</b>	<b>\$10,728</b>	<b>\$11,162</b>	<b>\$11,545</b>	<b>\$33,435</b>	<b>\$64,995</b>
7	Western U.S.	\$2,832	\$2,632	\$4,032	\$9,496	\$3,200	\$3,265	\$3,223	\$9,688	\$19,184
8	Eastern U.S.	\$3,283	\$2,875	\$2,433	\$8,591	\$3,343	\$2,484	\$2,504	\$8,331	\$16,922
9	Canada	\$2,120	\$2,421	\$2,287	\$6,828	\$3,255	\$2,843	\$2,002	\$8,100	\$14,928
10	Mexico	\$3,232	\$3,621	\$2,544	\$9,397	\$3,285	\$3,469	\$2,743	\$9,497	\$18,894
11	<b>North America</b>	<b>\$11,467</b>	<b>\$11,549</b>	<b>\$11,296</b>	<b>\$34,312</b>	<b>\$13,083</b>	<b>\$12,061</b>	<b>\$10,472</b>	<b>\$35,616</b>	<b>\$69,928</b>
12	China	\$3,221	\$2,134	\$2,243	\$7,598	\$3,998	\$3,212	\$3,102	\$10,312	\$17,910
13	Japan	\$2,643	\$2,328	\$3,244	\$8,215	\$3,899	\$2,999	\$2,688	\$9,586	\$17,801
14	South Korea	\$3,904	\$2,843	\$2,843	\$9,590	\$2,432	\$2,987	\$3,087	\$8,506	\$18,096
15	Indonesia	\$3,323	\$3,098	\$2,432	\$8,853	\$2,250	\$2,632	\$2,732	\$7,614	\$16,467
16	<b>Asia Pacific</b>	<b>\$13,091</b>	<b>\$10,403</b>	<b>\$10,762</b>	<b>\$34,256</b>	<b>\$12,579</b>	<b>\$11,830</b>	<b>\$11,609</b>	<b>\$36,018</b>	<b>\$70,274</b>
17	<b>Grand Total</b>	<b>\$34,730</b>	<b>\$33,439</b>	<b>\$31,959</b>	<b>\$100,128</b>	<b>\$36,390</b>	<b>\$35,053</b>	<b>\$33,626</b>	<b>\$105,069</b>	<b>\$205,197</b>

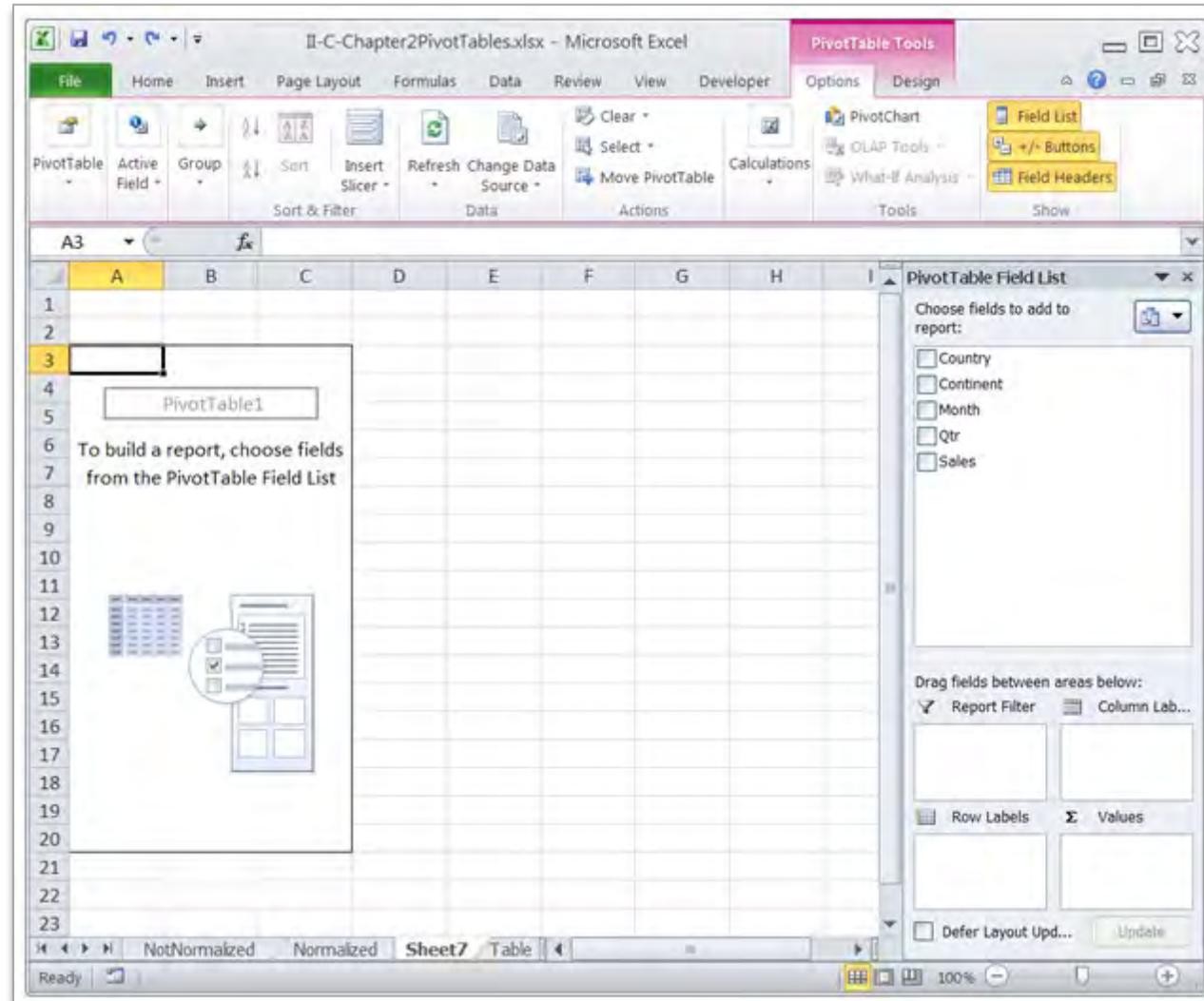
Range of Data That Are Not Normalized (Incorrectly Formatted)

# Normalized Data

Range of Data That Are Normalized for a Pivot Table

	A	B	C	D	E
1	<b>Country</b>	<b>Continent</b>	<b>Month</b>	<b>Qtr</b>	<b>Sales</b>
2	France	Europe	Jan	Qtr-1	\$2,243
3	France	Europe	Feb	Qtr-1	\$2,432
4	France	Europe	Mar	Qtr-1	\$2,503
5	France	Europe	Apr	Qtr-2	\$2,488
6	France	Europe	May	Qtr-2	\$3,055
7	France	Europe	Jun	Qtr-2	\$3,342
8	Germany	Europe	Jan	Qtr-1	\$2,454
9	Germany	Europe	Feb	Qtr-1	\$2,498
10	Germany	Europe	Mar	Qtr-1	\$2,072
11	Germany	Europe	Apr	Qtr-2	\$2,699
12	Germany	Europe	May	Qtr-2	\$3,264
13	Germany	Europe	Jun	Qtr-2	\$3,183
14	Spain	Europe	Jan	Qtr-1	\$2,843
15	Spain	Europe	Feb	Qtr-1	\$3,923
16	Spain	Europe	Mar	Qtr-1	\$3,243
17	Spain	Europe	Apr	Qtr-2	\$3,285
18	Spain	Europe	May	Qtr-2	\$2,288
19	Spain	Europe	Jun	Qtr-2	\$2,288
20	Portugal	Europe	Jan	Qtr-1	\$2,632
21	Portugal	Europe	Feb	Qtr-1	\$2,634
22	Portugal	Europe	Mar	Qtr-1	\$2,082

# Empty Table and Pivot Table Field List



# Pivot Table Providing Same Summary Information

The screenshot displays a PivotTable in Microsoft Excel. The PivotTable is titled 'Sum of Sales' and is located in the range A3:J21. The PivotTable Field List task pane is open on the right, showing the following configuration:

- Report Filter:** Qtr
- Column Labels:** Month
- Row Labels:** Continent
- Values:** Sum of Sales

The PivotTable data is as follows:

	Qtr-1			Qtr-2			Qtr-2 Total	Grand Total	
Row Labels	Jan	Feb	Mar	Apr	May	Jun			
<b>Asia Pacific</b>	<b>\$13,091</b>	<b>\$10,403</b>	<b>\$10,762</b>	<b>\$34,256</b>	<b>\$12,579</b>	<b>\$11,830</b>	<b>\$11,609</b>	<b>\$36,018</b>	<b>\$70,274</b>
China	\$3,221	\$2,134	\$2,243	\$7,598	\$3,998	\$3,212	\$3,102	\$10,312	\$17,910
Indonesia	\$3,323	\$3,098	\$2,432	\$8,853	\$2,250	\$2,632	\$2,732	\$7,614	\$16,467
Japan	\$2,643	\$2,328	\$3,244	\$8,215	\$3,899	\$2,999	\$2,688	\$9,586	\$17,801
South Korea	\$3,904	\$2,843	\$2,843	\$9,590	\$2,432	\$2,987	\$3,087	\$8,506	\$18,096
<b>Europe</b>	<b>\$10,172</b>	<b>\$11,487</b>	<b>\$9,901</b>	<b>\$31,560</b>	<b>\$10,728</b>	<b>\$11,162</b>	<b>\$11,545</b>	<b>\$33,435</b>	<b>\$64,995</b>
France	\$2,243	\$2,432	\$2,503	\$7,178	\$2,488	\$3,055	\$3,342	\$8,885	\$16,063
Germany	\$2,454	\$2,498	\$2,072	\$7,024	\$2,699	\$3,264	\$3,183	\$9,146	\$16,170
Portugal	\$2,632	\$2,634	\$2,083	\$7,349	\$2,256	\$2,555	\$2,732	\$7,543	\$14,892
Spain	\$2,843	\$3,923	\$3,243	\$10,009	\$3,285	\$2,288	\$2,288	\$7,861	\$17,870
<b>North America</b>	<b>\$11,467</b>	<b>\$11,549</b>	<b>\$11,296</b>	<b>\$34,312</b>	<b>\$13,083</b>	<b>\$12,061</b>	<b>\$10,472</b>	<b>\$35,616</b>	<b>\$69,928</b>
Canada	\$2,120	\$2,421	\$2,287	\$6,828	\$3,255	\$2,843	\$2,002	\$8,100	\$14,928
Eastern U.S.	\$3,283	\$2,875	\$2,433	\$8,591	\$3,343	\$2,484	\$2,504	\$8,331	\$16,922
Mexico	\$3,232	\$3,621	\$2,544	\$9,397	\$3,285	\$3,469	\$2,743	\$9,497	\$18,894
Western U.S.	\$2,832	\$2,632	\$4,032	\$9,496	\$3,200	\$3,265	\$3,223	\$9,688	\$19,184
<b>Grand Total</b>	<b>\$34,730</b>	<b>\$33,439</b>	<b>\$31,959</b>	<b>\$100,128</b>	<b>\$36,390</b>	<b>\$35,053</b>	<b>\$33,626</b>	<b>\$105,069</b>	<b>\$205,197</b>

# Use Slicers

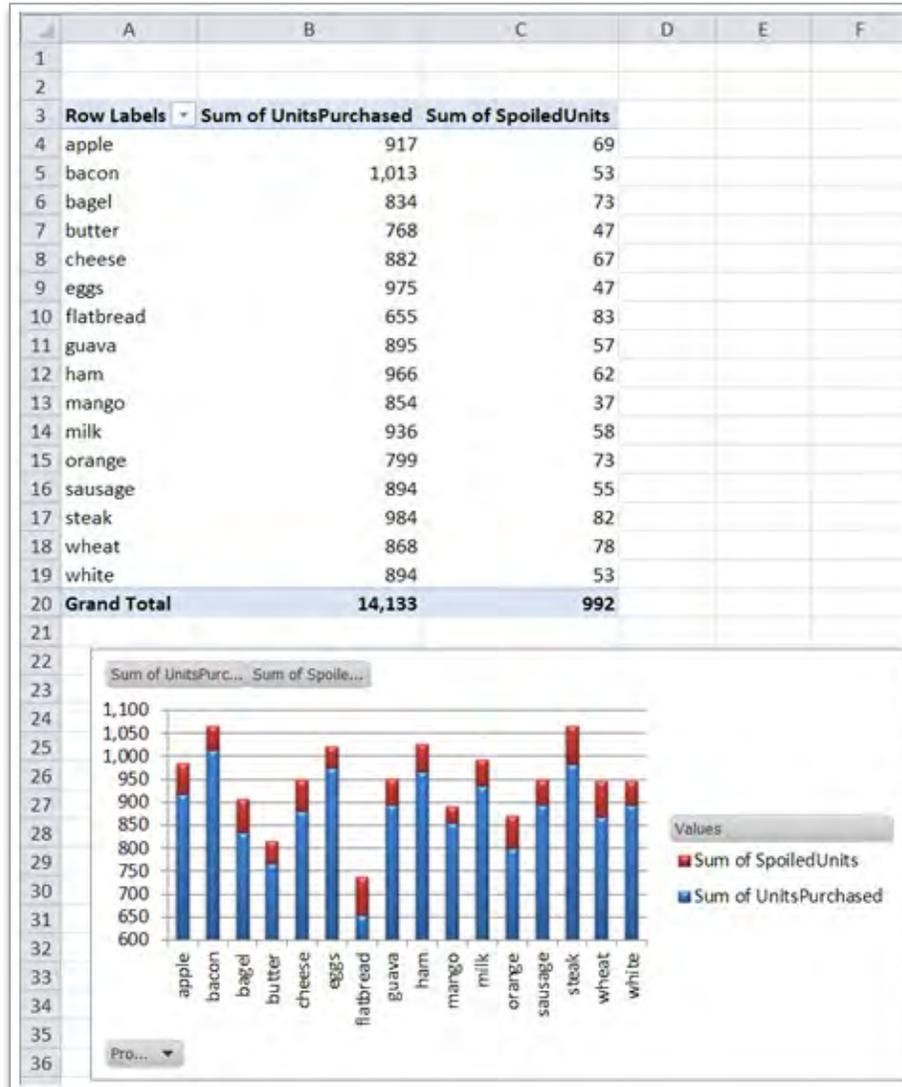
The screenshot shows an Excel PivotTable with the following data:

Row Labels	Jan	Feb	Qtr-1 Total	Grand Total
Europe	\$2,243	\$2,432	\$4,675	\$4,675
France	\$2,243	\$2,432	\$4,675	\$4,675
North America	\$2,120	\$2,421	\$4,541	\$4,541
Canada	\$2,120	\$2,421	\$4,541	\$4,541
<b>Grand Total</b>	<b>\$4,363</b>	<b>\$4,853</b>	<b>\$9,216</b>	<b>\$9,216</b>

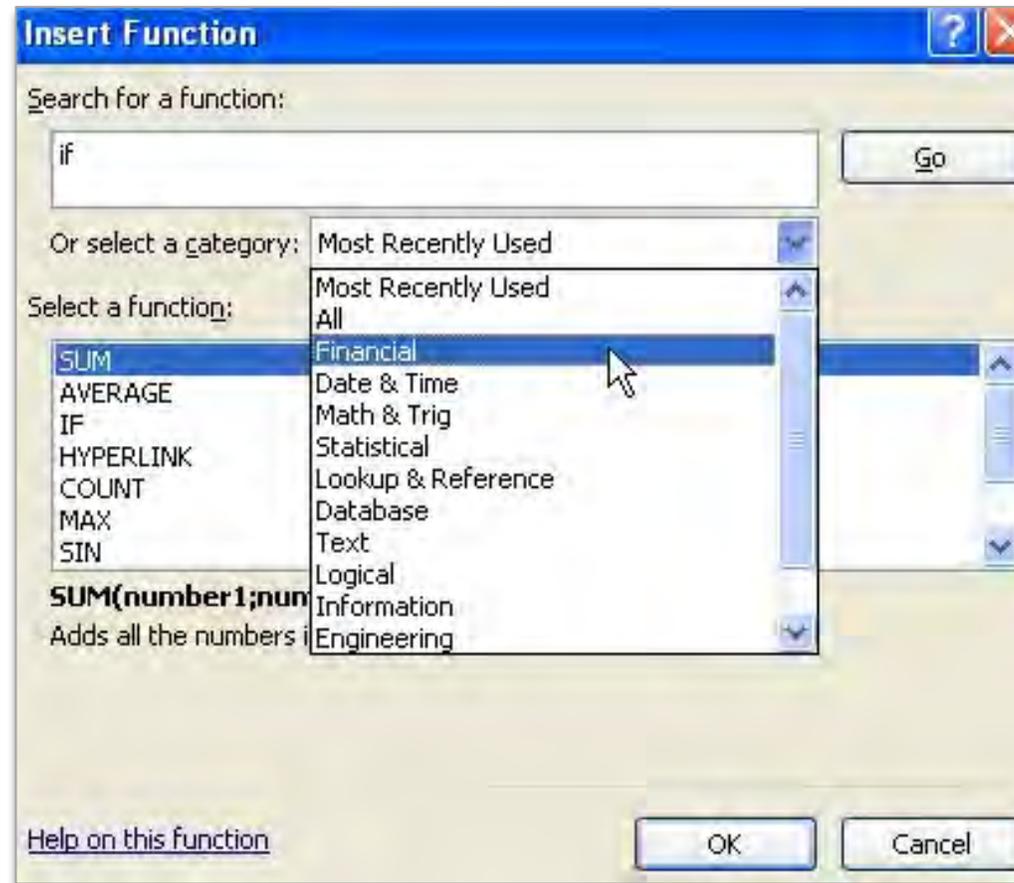
Two slicers are visible below the table:

- Month Slicer:** Shows 'Jan' and 'Feb' selected.
- Country Slicer:** Shows 'Canada', 'France', and 'Mexico' selected.

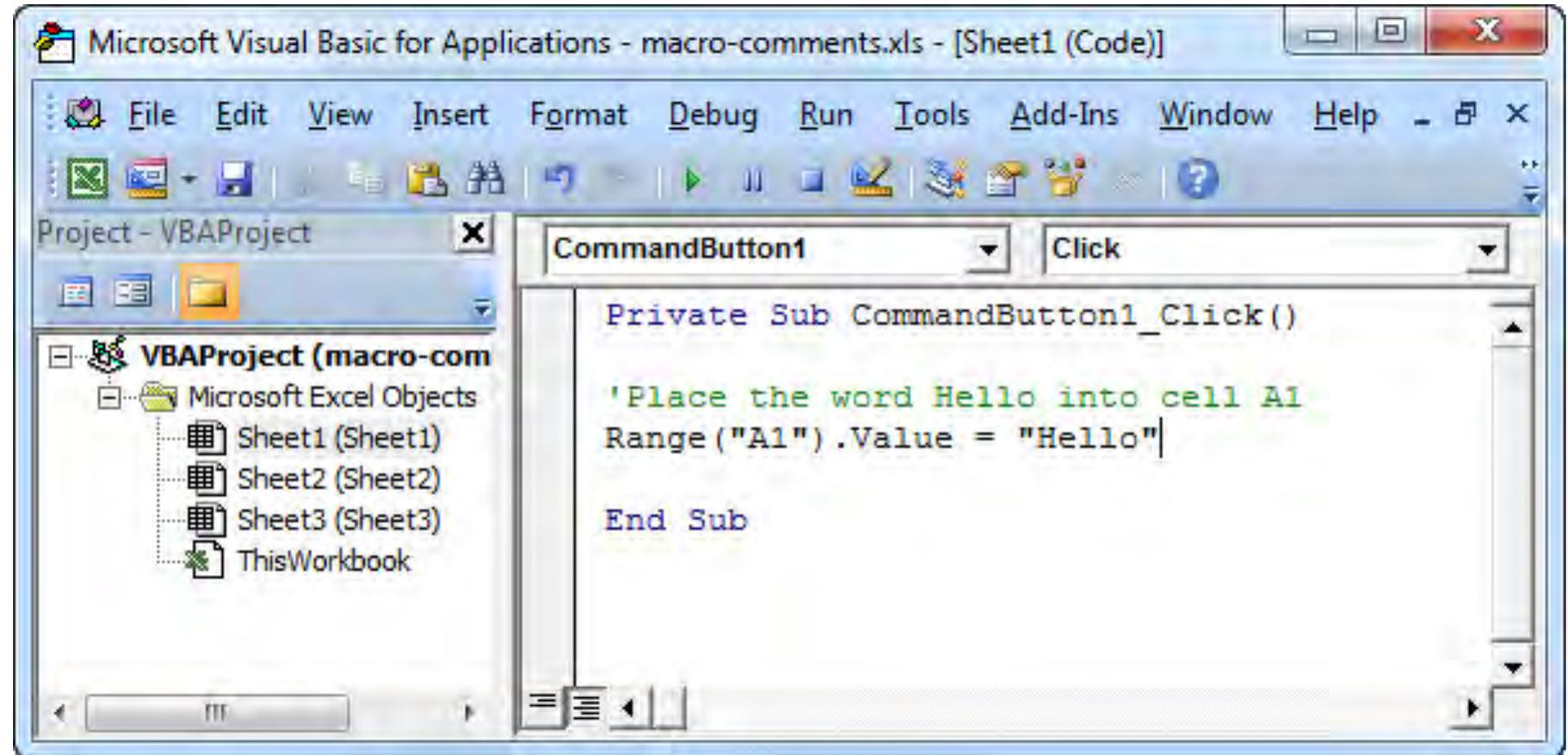
# Generate a Pivot Chart



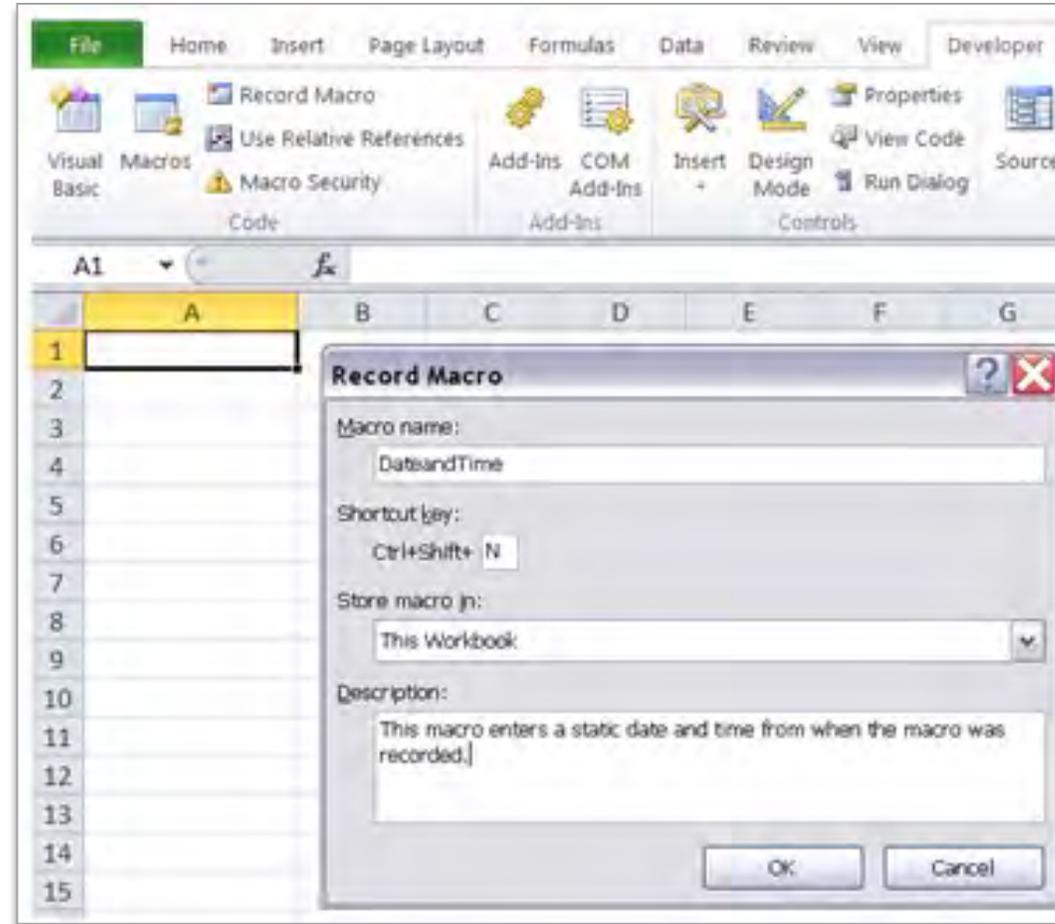
# Financial Functions



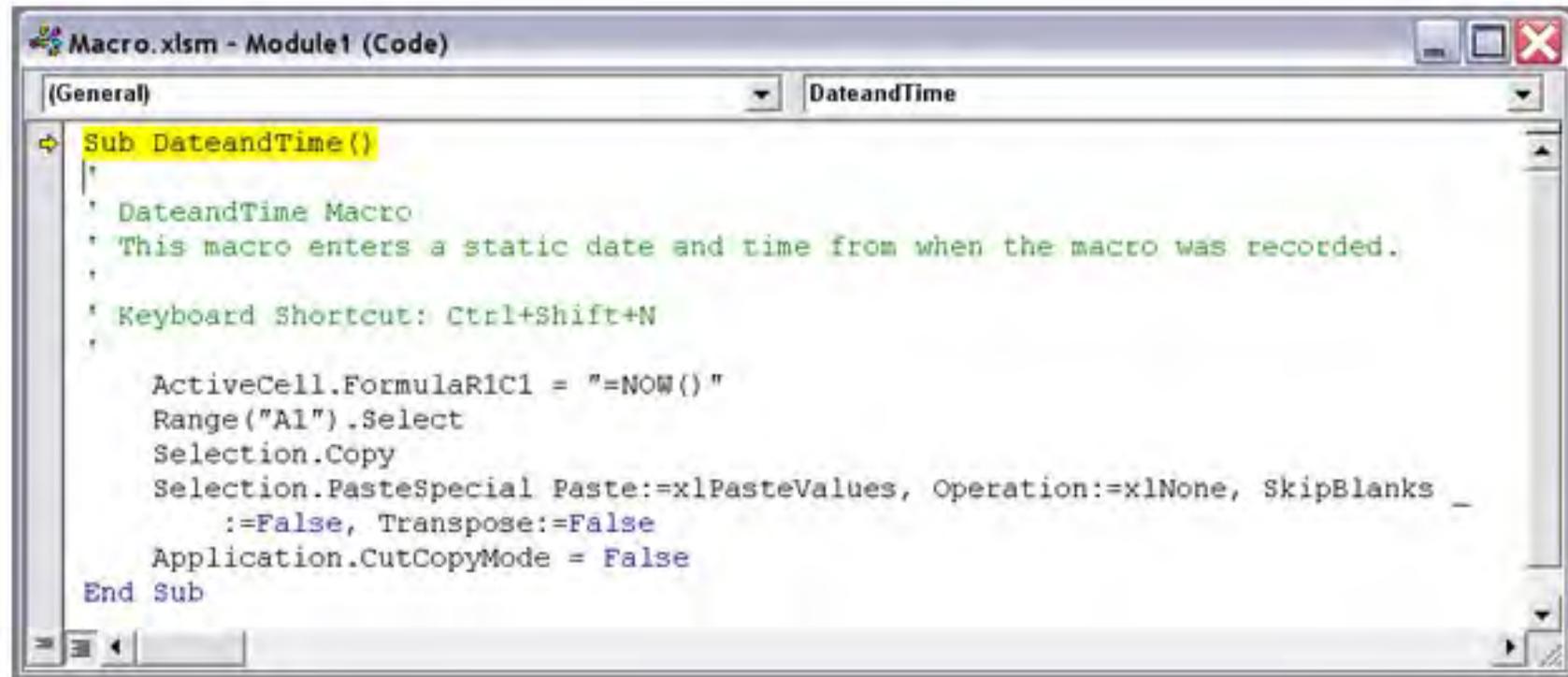
# Introduction to VBA



# Creating Macros



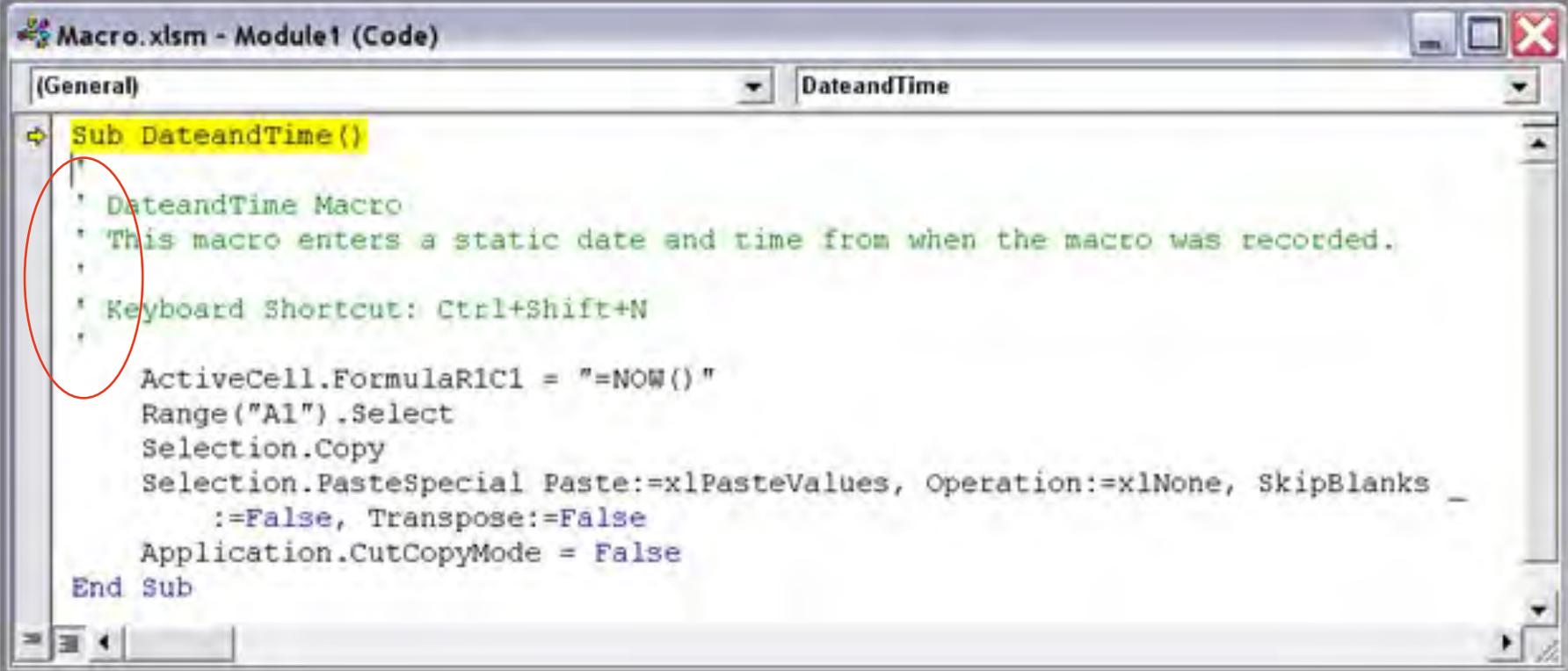
# Editing Macros



The screenshot shows the VBA Editor window for a macro named "DateandTime" in a module named "Module1 (Code)". The code is as follows:

```
Sub DateandTime()  
    ' DateandTime Macro  
    ' This macro enters a static date and time from when the macro was recorded.  
    '  
    ' Keyboard Shortcut: Ctrl+Shift+N  
    '  
    ActiveCell.FormulaR1C1 = "=NOW()"  
    Range("A1").Select  
    Selection.Copy  
    Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _  
        :=False, Transpose:=False  
    Application.CutCopyMode = False  
End Sub
```

# Documenting Macros using Macro Comments

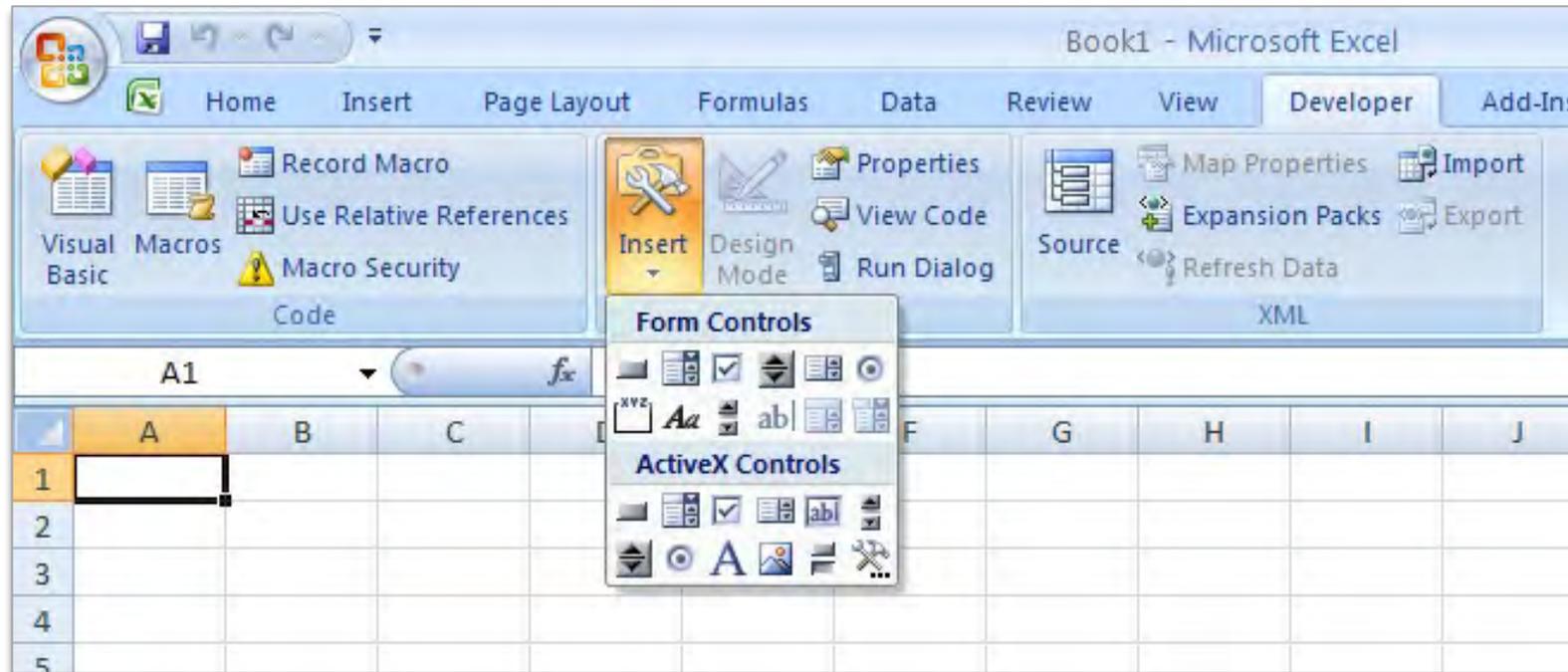


The screenshot shows the VBA Editor window for 'Macro.xlsm - Module1 (Code)'. The 'DateandTime' macro is selected. The code is as follows:

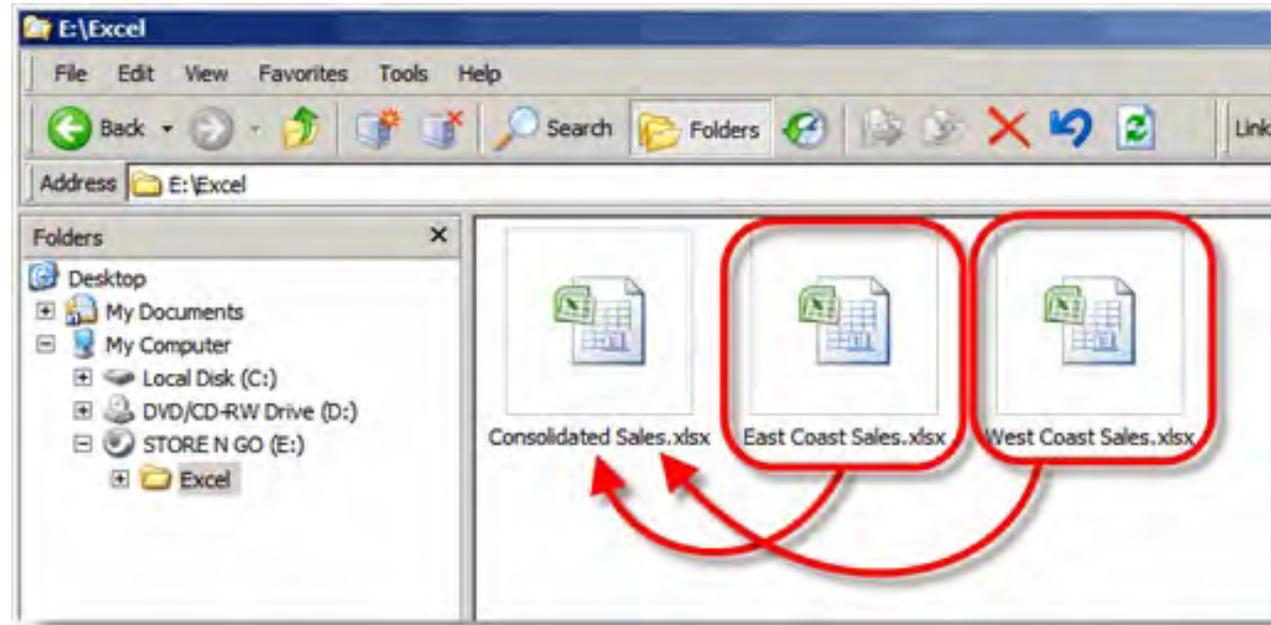
```
Sub DateandTime()  
    ' DateandTime Macro  
    ' This macro enters a static date and time from when the macro was recorded.  
    '  
    ' Keyboard Shortcut: Ctrl+Shift+N  
    '  
    ActiveCell.FormulaR1C1 = "=NOW()"  
    Range("A1").Select  
    Selection.Copy  
    Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _  
        :=False, Transpose:=False  
    Application.CutCopyMode = False  
End Sub
```

A red circle highlights the first four lines of the macro, which are comments. The first line is highlighted in yellow.

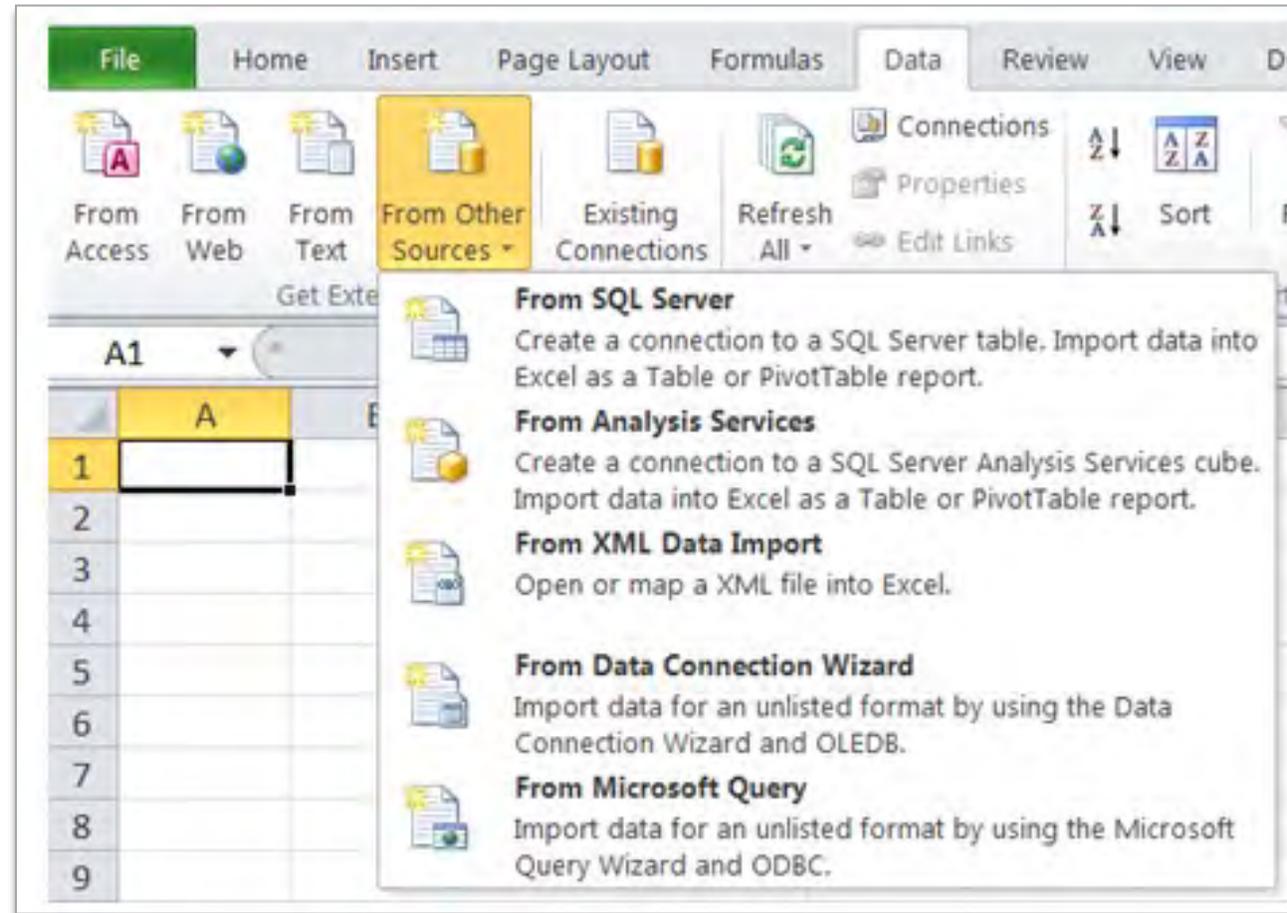
# UserForms (ActiveX Version)



# Link Workbooks



# Getting Data from External Databases



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ANALYSIS PROFESSIONAL**

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Part I  
Domain 3: Systems and Technology  
Chapter 8: Using Worksheets and  
Worksheet Functions

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# **Part 1**

## **Domain B: Systems and Technology**

### **Chapter 9: Working with Data**

# Working With Data

## *Topics Overview*

- *Understand Relational Databases*
- *Create Database Queries*
- *Use ERP/GL Systems*
- *Use Business Intelligence Software*
- *Data Management, Internal Controls & Governance*

# A Database Management System (DBMS)

Database table creation, change and deletion

Transaction control (controlling data entry, change and deletion)

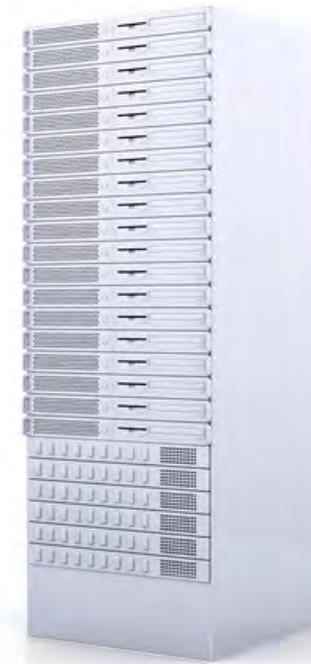
Interfaces for queries, reporting or other automated data retrievals

Security and access control

Back-up and recovery

Data integrity control

Application programming interfaces



# Relational Databases

Primary Key

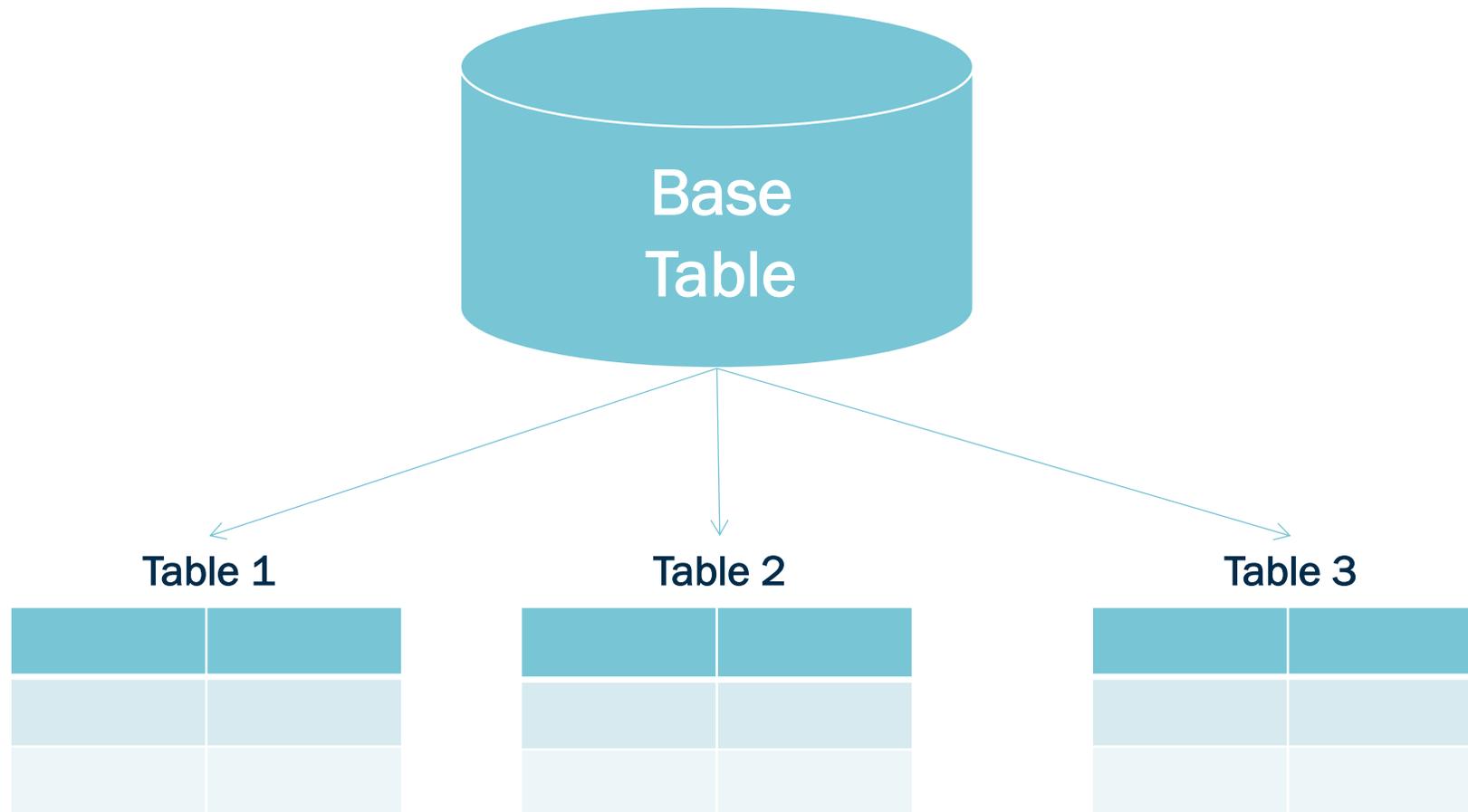
	A	B	C	D	E	F	G	H	I	J
1	customer_ID	last_name	first_name	sex	address	appt	city	state	ZIP	phone_number
2	100001	Bombarg	John	1	123 Main St.		Springfield	MN	55432	(651)555-2294
3	100002	Smith	Jim	1	4293 First Ave.		Minneapolis	MN	55404	(612)555-3243
4	100003	Jones	Cindy	0	2237 Birch St.	420	Eagan	MN	55121	(651)555-4329
5	100004	Lee	Cheng	1	2324 Polk St.		Minneapolis	MN	44408	(612)555-1235
6	→ 100005	Hernandez	Jaime	1	3987 Valley Dr.	32	Eagan	MN	55121	(651)555-3239
7	100006	Hernandez	Maria	0	3987 Valley Dr.	32	Eagan	MN	55121	(651)555-3239
8	100007	Shim	Jack	1						
9	100008	O'Reilley	Mary	0	2972 Ash St.		Richfield	MN	55432	(651)555-3928

Primary Key Foreign Key

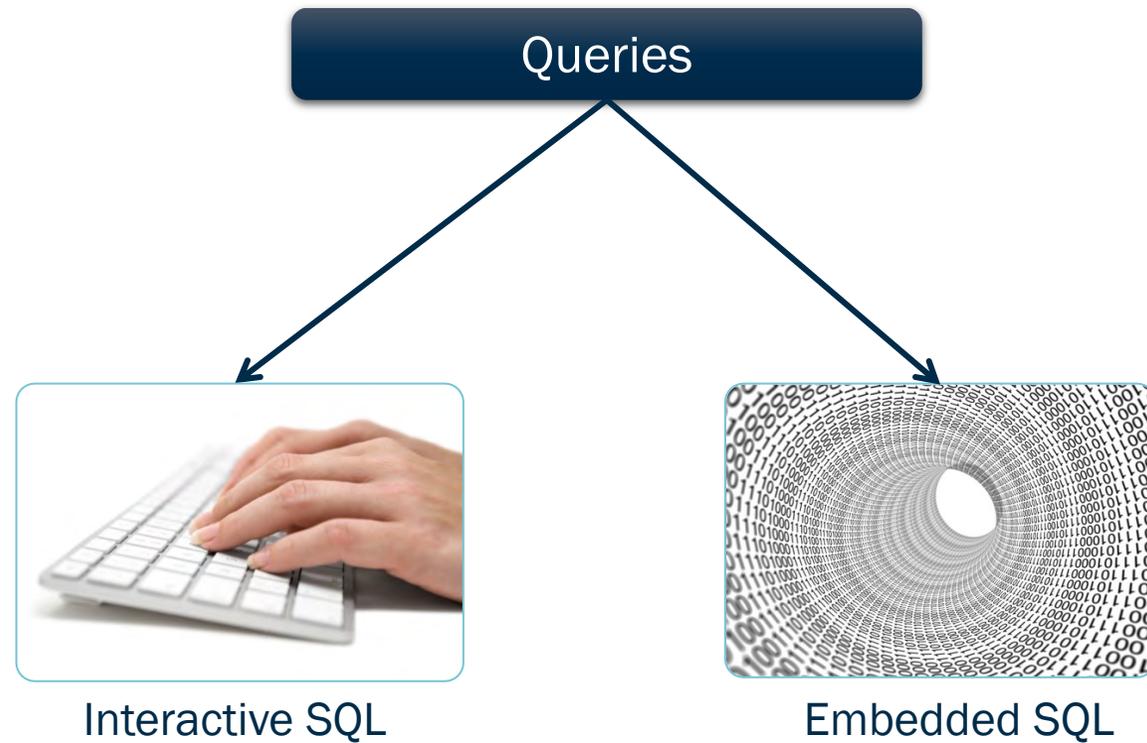
	A	B	C	D	E
1	order_num	customer_ID	order_date	order_total	order_filled
2	900001	100343	13-Jun-14	\$850.98	1
3	900002	→ 100005	13-Jun-14	\$425.77	1
4	900003	123234	13-Jun-14	\$962.23	0
5	900004	100323	13-Jun-14	\$329.43	0
6	900005	100487	13-Jun-14	\$875.35	1
7	900006	189932	14-Jun-14	\$732.05	1
8	900007	193824	14-Jun-14	\$213.56	1
9	900008	→ 100005	14-Jun-14	\$688.55	1
10	900009	103892	14-Jun-14	\$923.64	0

Only the primary key needs to be unique and not null

# Database Base Tables and Views



# Create Database Queries



# Using SELECT

Syntax of SELECT is...

```
SELECT column1, column2...  
FROM  
table1, table2...  
WHERE predicate;
```



# Selecting Columns

```
SELECT last_name, first_name, phone  
FROM customer;
```



Last_Name	First_Name	Phone
Heideman	Sherry	507-555-1212
Heideman	Annie	507-448-1321
Stilley	Emerlee	507-448-3737
Trytten	Mike	507-373-1200
Willand	Jill	507-377-1090

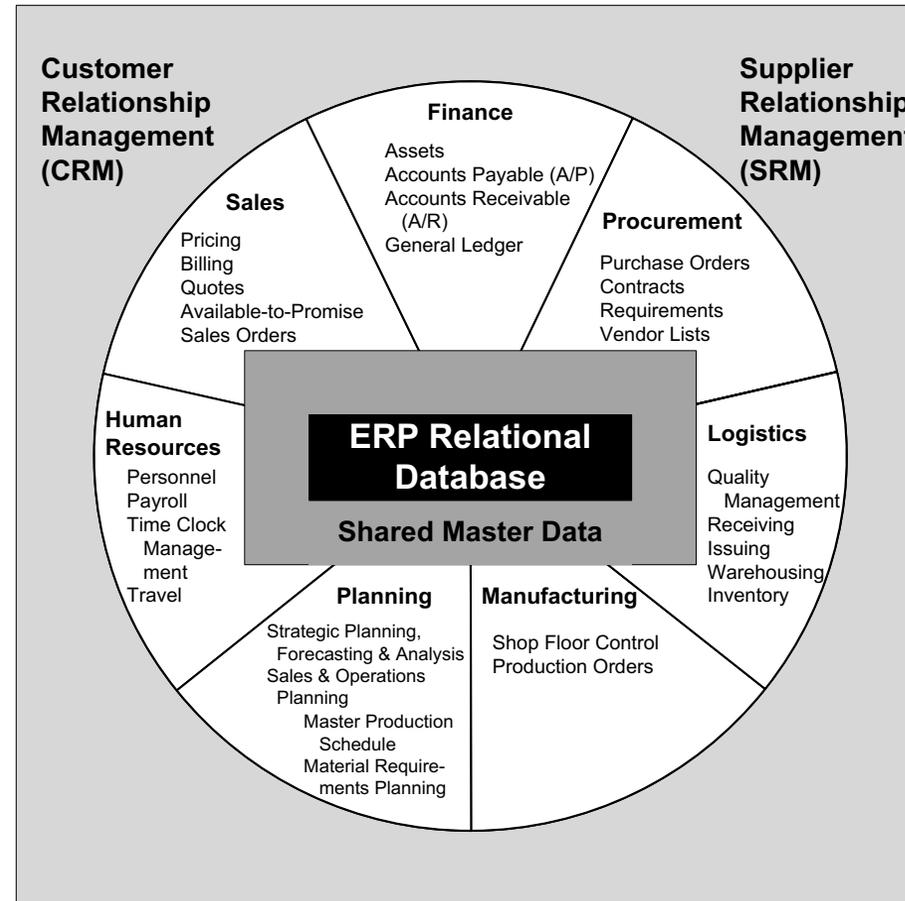


# Enterprise Resource Planning



- Organize, define and standardize business processes to enable effective system-wide planning and control
- Harness all available internal information to help produce external advantage

# ERP System Modules



# Common Organizational Issues Related to ERP Systems

## Issues...

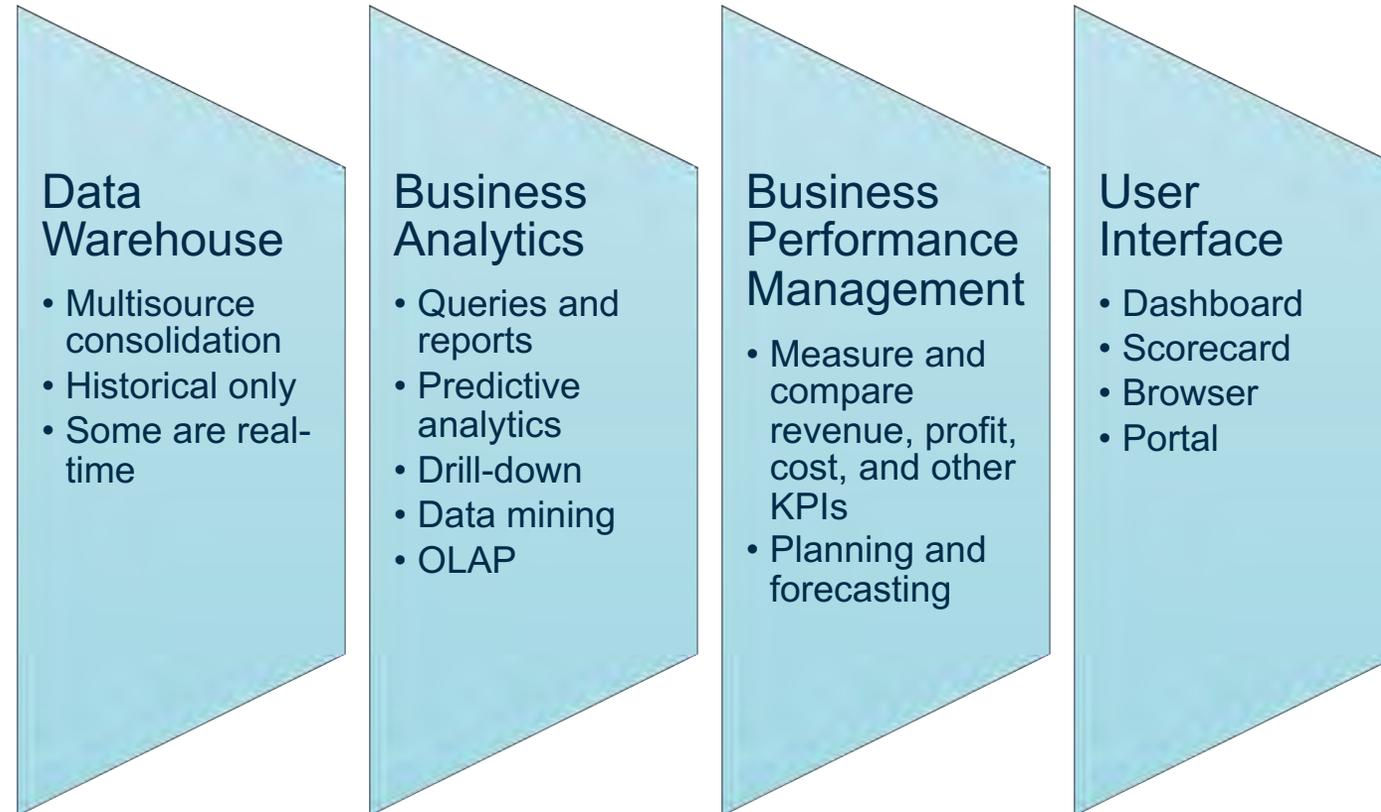
- Many organizations have multiple ERP systems,
- Many organizations have multiple versions of the same ERP system,
- Some organizations heavily customize (reprogram) or configure (select settings) ERP systems, which can exacerbate the above issues

# Introduction to Business Intelligence Software

## BI Software packages on the market

- Oracle Hyperion
- IBM Cognos and SPSS
- SAP BusinessObjects
- Information Builders
- Microsoft
- SAS
- MicroStrategy
- Whitebirch Software
- Anaplan

# Major Components of BI Systems



# Data Warehouses and Data Marts

## Data Warehouse

An integrated source for holding data from different sources in a consistent format.

## Data Mart

Smaller subsets of a data warehouse that focus on a particular department or subject area.

# Characteristics of a Data Warehouse and/or Data Mart



Subject-oriented



Time series



Integrated data



Read-only

# Business Analytics

## Types of patterns that data mining identifies

- Associations between transactions, such as two items that are commonly purchased at the same time
- Predictions about future events based on historical trends
- Clusters or segmentations of things that tend to behave similarly, for example, new customer segments
- Sequential or time-based relationships such as typical add-on purchases by a customer once an initial purchase has been made

# Business Performance Management (BPM)



# User Interface

## BI user interfaces:

- Output screen
- Web browser
- Dashboard

# Selecting the Right Tool for the Task and User



# Data Management, Internal Controls and Governance

- **Data only gains value when applied to a process**
  - Data serves a purpose when it answers a question
- **Benefit of an optimal data collection and processing framework:**
  - Improved efficiency and increased time to devote to other projects
- **Thinking through this helps determine the right question that needs to be answered and the data that should be collected.**
- **A common hindrance of new data collection is an over-reliance on old KPIs**
  - Courage is needed along with increased collaboration

# Two Categories of Systems Faced in Data Collection

- **Transactional Systems**
  - Where company transactions are recorded and managed
  - Designed to run one process efficiently
  - Not built for agility
- **Decisional Systems**
  - Data is aggregated, analyzed, and reported

# The Decision Stack



# What Can Go Wrong in Implementation?

- Selection of the solution
- Absence of business involvement
- Implementation of the solution won't fit the culture and specifics of the organization
- Rigid implementation plans
- Fear and too much thinking and planning may prevent people from starting on the project

# Improving the Accessibility and Usefulness of Data

**Data fluidity:** Data that is accessible and that can be shared and processed without delay and which usage does not alter its consistency and quality.

Two rules to ensure fluidity:

Store data first and then process/analyze it

Store data in table format (e.g., text file or CSV)

# Seven Steps of the Data Supply Chain

1. Execute
2. Report
3. Analyze
4. Store
5. Organize
6. Collect
7. Identify

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Part I

Domain 3: Systems and Technology

Chapter 9: Working with Data

# **Part 1**

## **Domain C: Business Partnering**

### **Chapter 10: Information and FP&A**

# Information and FP&A

## *Topics Overview*

- *What FP&A Must Know*
- *The Role of FP&A*
- *Challenges in Information Gathering*

# Beginning the FP&A Journey: The Role of FP&A

To gather and interpret information with the goal of creating actionable business intelligence.

Provide timely and accurate commentary

Provide reliable recommendations

An emphasis on business analytics



# What FP&A Must Know

## The firm's strategy

- How the firm will position itself relative to its competition and use its resources to gain a sustainable competitive advantage
- Cost leader, differentiation, etc.

FP&A's role: support and/or drive

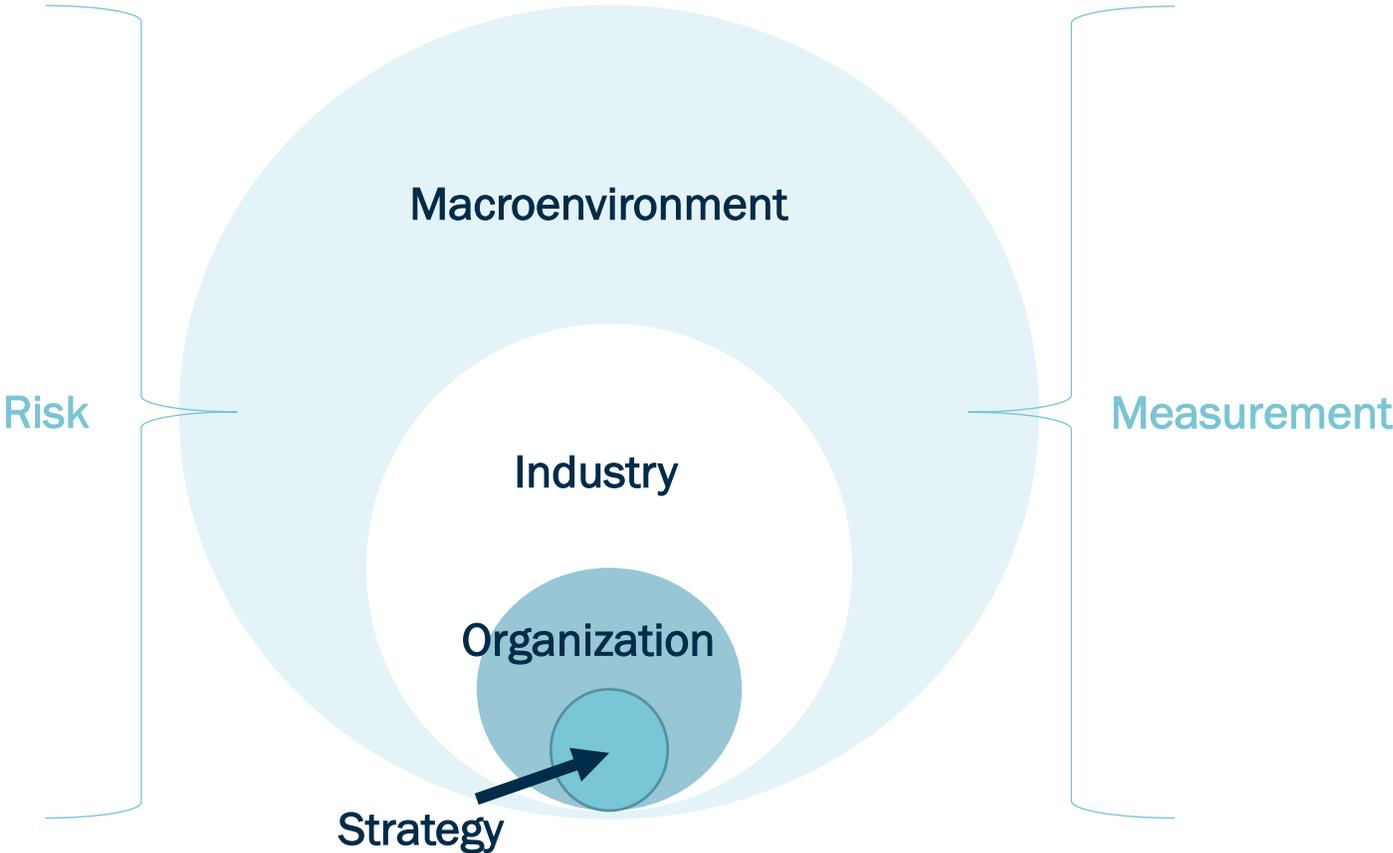
Key financial metrics

# What FP&A Must Know

## Where to find acceptable information sources

- Internal records, such as previous analyses
- Publicly available records, such as annual and quarterly reports
- People—including stakeholders and partners within the organization, colleagues in the industry and outside experts
- Research services
- General business media

# The Sources of FP&A Information



# What FP&A Must Know

## The key areas of risk

- Qualitative factors or vulnerabilities
  - Weaknesses and threats and R&O schedules
- Quantitative risk metrics
  - Standard deviation, Beta, VAR

# Budgeting Role

FP&A gathers forecasts of revenue and assessments of risks and opportunities that could affect revenue

- Macroeconomic and microeconomic factors

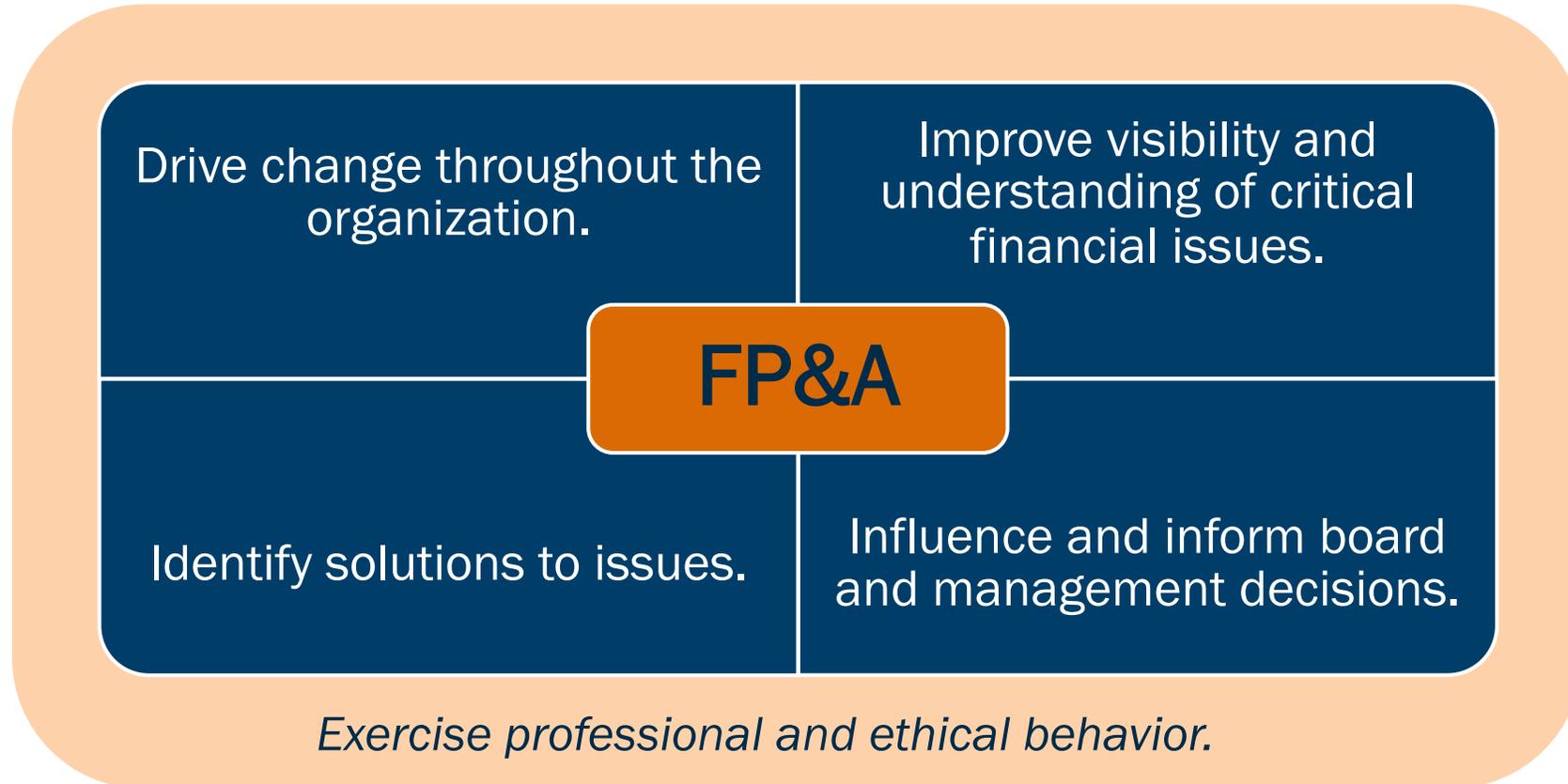
## Bottom Up vs. Top Down Budgets

Determines its reasonableness

- History
- Industry norms
- Competition
- Economic conditions



# FP&A Tasks



# AFP Standards of Professional Conduct

Competence

Maintaining competence in one's field as well as awareness of legal and regulatory requirements

Confidentiality

Safeguarding the confidentiality of the organization's information and respecting data privacy laws

Integrity

Performing tasks with honesty and accuracy, avoiding conflicts of interest

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# **Part 1**

## **Domain C: Business Partnering**

### **Chapter 11: Organization**

# Organization

*Accessing data, partnering, performance measurement*

## *Topics Overview*

- *Organizational structure*
- *Organizational culture*
- *Stakeholders and business partners*
- *Measuring organizational performance*
- *Business and support process risks*
- *Sources of organizational information*

# Organizational Structures

## Structure Types:

- Functional organizations
- Divisional organizations
- Matrix organizations

## Centralized and decentralized organizations

## Organizational decision makers

- Board
- Senior management
- Middle management

# Workplace Cultures

Formal	Informal
<p>Highly visible:</p> <ul style="list-style-type: none"> <li>• Written policies, standards, processes</li> <li>• Organization charts</li> <li>• Calendars</li> <li>• Symbols of power and status</li> </ul>	<p>Invisible from outside:</p> <ul style="list-style-type: none"> <li>• Unwritten traditions and rituals</li> <li>• Unsignaled status and roles (e.g., respected influencers)</li> </ul>
Static or changed through formal change management process	Changing constantly in an evolutionary or adaptive manner
Unity achieved by established order, joint visions and goals	Unity achieved through trust and reciprocal behavior (i.e., favors)
Planned communication - occurs vertically and horizontally	Spontaneous communication - occurs in a network structure, across reporting lines and functional silos
Strict formats for communication	Casual e-mails, not for circulation

# Stakeholders

**Stakeholders: Individuals, groups, or business functions that have an interest in the activities of an organization**

- Internal- employees, executives, and business support processes
- External- Clients, community partners, and sourcing providers

# Identifying Stakeholders for Partnering

Partners work directly with the firm and value through a collaborative approach.

Identifying stakeholders for partnering involves a deep understanding of the value drivers and KPIs that influence the firm's value creation.

Where does the stakeholder fit within the context of our value creation process?

- Balanced scorecard approach

# Balanced Scorecard

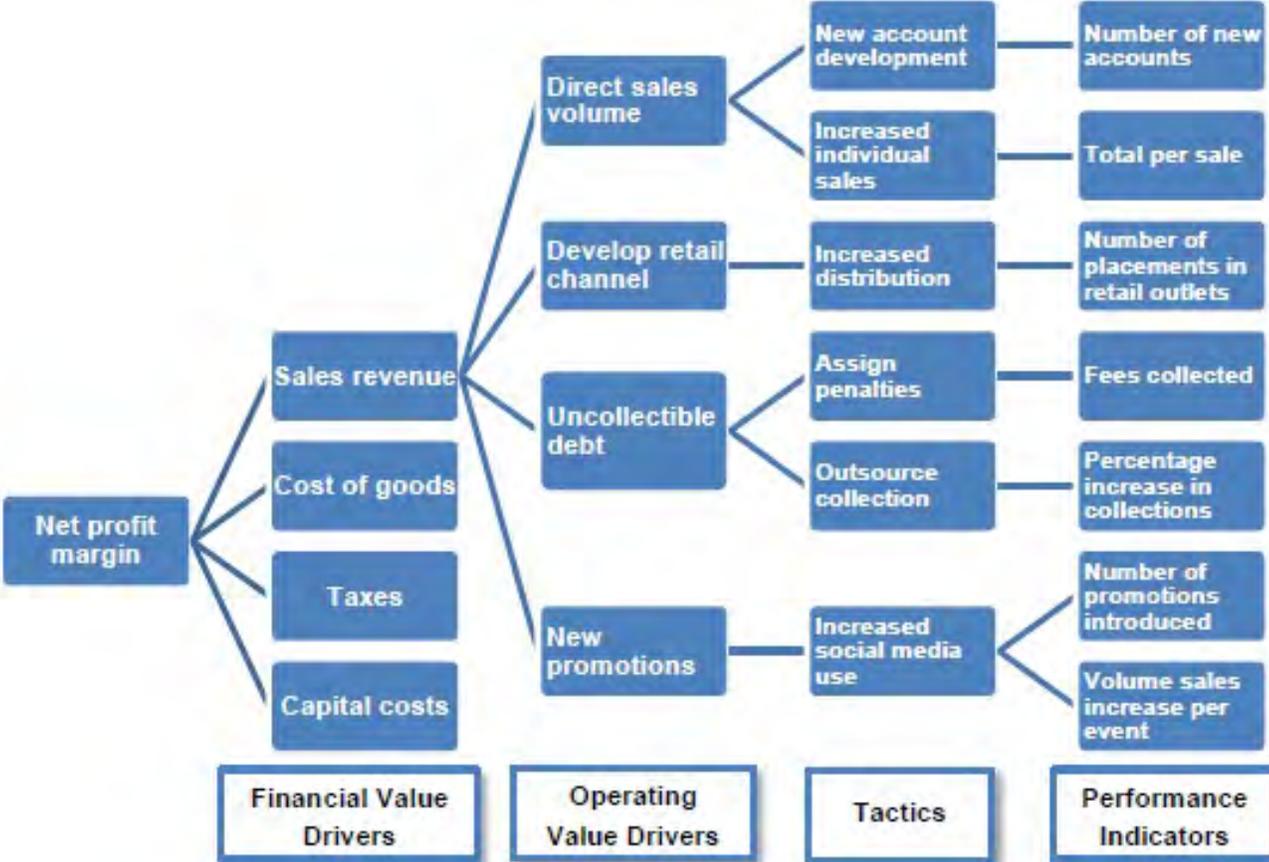


# Measuring Organizational Performance

The measurement framework includes:



# Value Driver Tree



# Guidance on Planning and Projections

In addition to benchmarking, FP&A personnel can provide invaluable help in providing continued and up-to-date guidance to stakeholders on

- Any changes in the firm's competitive advantages and the resulting impact on strategy
- Changes to financial projections

# Key Performance Indicator (KPI)

**S**pecific

**M**easurable

**A**chievable

**R**elevant

**T**ime-based



# Business and Support Process Risks



- Each process and their value-driven activities are evaluated to:
- Measure the possible impact of risk and opportunity
- Identify actions that can be taken to ensure that risk is minimized and opportunity maximized
- Quantify the risk—its impact and its probability—on expected value (projected future value)

# Intervention

- If a change in a key area of risk is significant, an intervention may be required.
  - Change in business partner
  - Change in strategy
- Voluntary or involuntary

# Sources of Organizational Information

- Data records
- Reports
- Internal publications and communications
- Networking

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**Part 1**

**Domain C: Business Partnering**

**Chapter 12: Industry**

# Industry

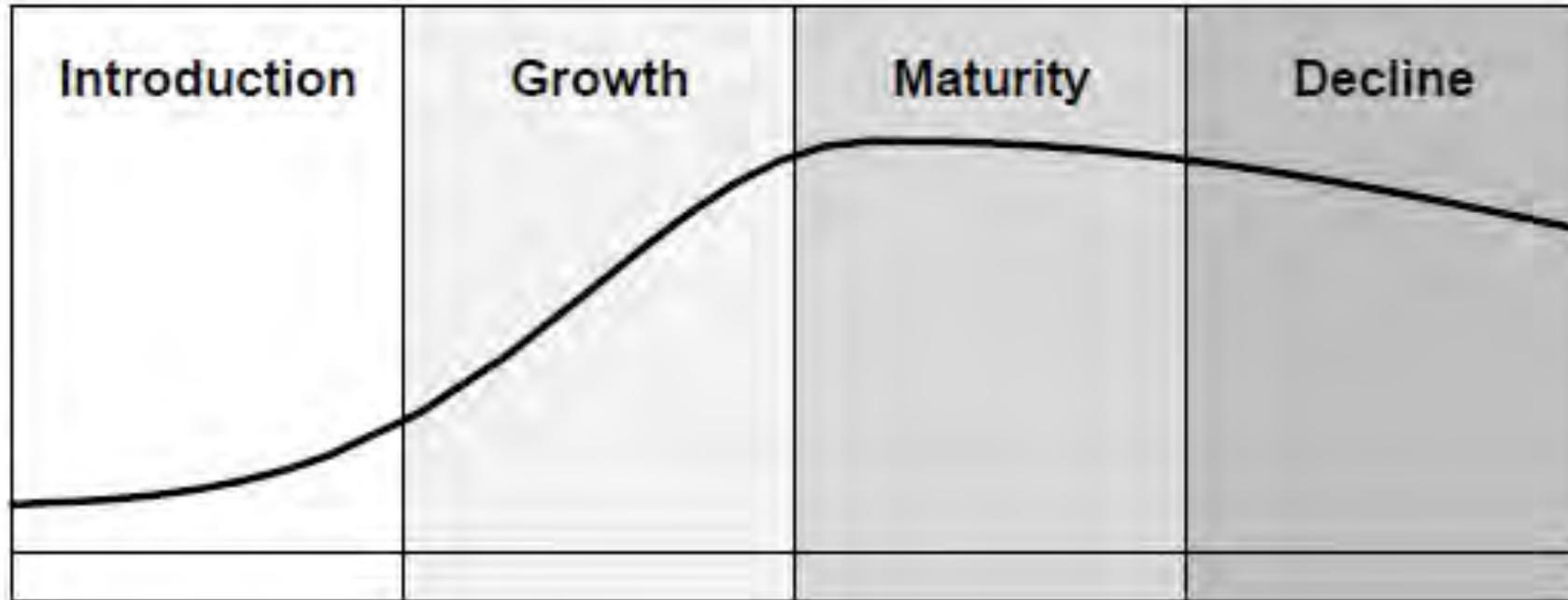
## *Topics Overview*

- *Industry Attributes*
- *Industry Benchmarks*
- *Industry Uncertainty*

# Industry Attributes

- Industry life cycle
- Economic attributes framework
- Porter's Five Forces

# Industry Life Cycle



# Economic Attributes Framework

Five “economic attributes” that tend to define industries:

- Demand
- Supply
- Operations
- Marketing
- Investing and financing



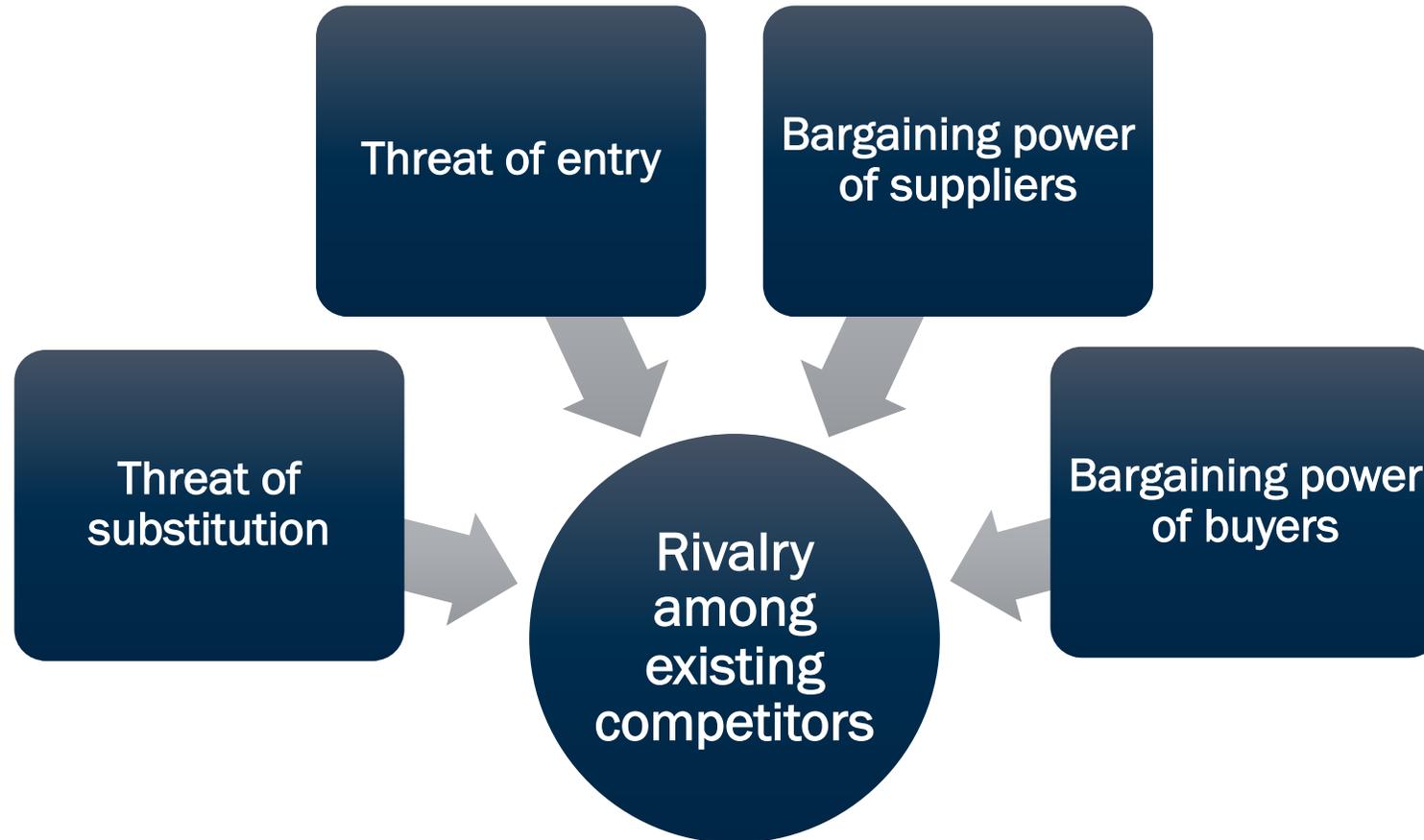
# Porter's Competitive Strategies

Cost leadership

Differentiation

Focus

# Porter's "Five Forces" Model



# Industry Benchmarks

How do we compare to.....

- Control for industry and firm size

# Market Share and Market Growth Rate

## Market Share

The ratio of one organization's sales to total sales of all competitors in that market for a specific period.

## Market Growth Rate

The percentage growth from the previous period for the industry as a whole and for individual competitors.

# Market Share and Market Growth Rate

Market Share and Market Growth Rate											
All Amounts in Millions											
Overall Market Growth Rate			15.0%	Actual Annual Sales		Projected Annual Sales			2016	2015	
Company	2013 Market Share	2013 Growth Rate	2013 Weighted Growth	2012	2013	2014	2015	2016	Share	Weighted Growth	
A	23.3%	11.0%	2.6%	\$676	\$750	\$833	\$925	\$1,027	21.0%	2.3%	
B	19.1%	13.0%	2.5%	\$544	\$615	\$695	\$785	\$888	18.2%	2.4%	
C	14.0%	5.0%	0.7%	\$428	\$450	\$473	\$497	\$522	10.7%	0.5%	
D	3.9%	22.0%	0.9%	\$102	\$125	\$153	\$186	\$227	4.6%	1.0%	
E	2.3%	67.0%	1.6%	\$45	\$75	\$125	\$209	\$350	7.1%	4.8%	
Other	37.3%	20.0%	7.5%	\$1,000	\$1,200	\$1,419	\$1,650	\$1,877	38.4%	7.7%	
<b>Total</b>	<b>100.0%</b>	<b>15.0%</b>	<b>15.0%</b>	<b>\$2,795</b>	<b>\$3,215</b>	<b>\$3,697</b>	<b>\$4,252</b>	<b>\$4,889</b>	<b>100.0%</b>	<b>15.0%</b>	

$$\text{Annual Growth Rate} = \text{Prior Year} * (1 + \text{Growth Rate})$$

$$= \$750 * (1 + 0.11) = \$833$$

$$\text{Percentage Change} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} = \left( \frac{\text{New Value}}{\text{Old Value}} \right) - 1$$

$$= \frac{\$750\text{M} - \$676\text{M}}{\$676\text{M}} = \left( \frac{\$750\text{M}}{\$676\text{M}} \right) - 1 = 11\%$$

# Competitor Analysis

When conducting a competitor analysis, FP&A should consider:

- Firms operating in the same industry
- The competitor's history
- Management statements in annual reports and business press
- The competitor's unique strengths and weaknesses



# Industry Uncertainty

## Four suggested levels of uncertainty

1. Fairly predictable
2. Two possible scenarios
3. Range of possible outcomes
4. No particular range of outcomes

# Industry Environment

- Tax issues
- Depreciation schedules

# Industry Environment: Taxation

## *Tax Terminology:*

- Statutory tax rate (STR)
- Effective tax rate (ETR)
- Marginal tax rate (MTR)
- Tax-favored treatment
- Tax planning
  - ✓ Current and deferred taxes
  - ✓ Multinational taxation

Taxable Income Range	Tax Rate
\$0-\$50,000	15%
50,000-75,000	25%
75,000-100,000	34%
100,000-335,000	39%*
335,000-10,000,000	34%
10,000,000-15,000,000	35%
15,000,000-18,333,333	38%*
18,333,333 and over	35%

\*"Bubble" to take back advantage of lower rates

$$ETR = \frac{\text{Income Tax}}{\text{Income Before Tax}}$$

# Depreciation Expense from Long-Lived Assets

**Matching principle requires it, but depreciation expense is not a true cash outflow**

- The key financial benefit from depreciation is the tax shield

**What is depreciable? The depreciable basis usually includes:**

- Purchase price/initial cost (shipping cost too)
- Installation cost

**Straight-line method for calculating depreciation expense:**

- Depreciation Expense =  $(\text{Cost} - \text{Residual Value}) / \text{Useful Life}$

# Depreciation Expense Examples

A machine has a depreciable basis of \$1,000,000 and a useful life of 4 years. At the end of 4 years, it is expected that the machine will be sold for \$100,000.

$$\text{S-L Dep Exp} = (\$1,000,000 - \$100,000) / 4 = \$225,000$$

# Calculating Straight-Line Depreciation

C12     =SLN(\$B\$4,\$B\$5,\$B\$6)								
	A	B	C	D	E	F	G	
1	<b>Calculating Depreciation for After-Tax Cash Flow (Straight-Line Depreciation)</b>							
2	All Amounts in Millions							
3	<b>Effective Income Tax Rate</b>		34.00%	33.00%	32.00%	31.00%	30.00%	
4	<b>Asset Cost</b>	\$100.0						
5	<b>Asset Salvage Value</b>	\$10.0						
6	<b>Asset Useful Life</b>	5 years						
7	<b>Discount Rate</b>	12.00%						
8	<b>Marginal Tax Rate</b>	32.11%						
9	<b>Project Year</b>	0	1	2	3	4	5 Totals	
10	<b>Revenue</b>	\$0.0	\$45.9	\$46.6	\$46.9	\$49.4	\$51.0	\$239.8
11	<b>Cash Expenses</b>	\$100.0	\$13.8	\$14.0	\$14.1	\$14.8	\$15.3	\$171.9
12	<b>Depreciation Expenses</b>	\$0.0	\$18.0	\$18.0	\$18.0	\$18.0	\$18.0	\$90.0
13	<b>Income Before Tax</b>	(\$100.0)	\$14.1	\$14.6	\$14.8	\$16.6	\$17.7	(\$22.1)
14	<b>Income Taxes</b>	\$0.0	\$4.8	\$4.8	\$4.7	\$5.1	\$5.3	\$24.8
15	<b>Income After Tax</b>	(\$100.0)	\$9.3	\$9.8	\$10.1	\$11.4	\$12.4	(\$47.0)
16	<b>Depreciation Add Back</b>	\$0.0	\$18.0	\$18.0	\$18.0	\$18.0	\$18.0	\$90.0
17	<b>After Tax Cash Flow</b>	(\$100.0)	\$27.3	\$27.8	\$28.1	\$29.4	\$30.4	\$43.0
18	<b>Cumulative CF</b>	(\$100.0)	(\$72.7)	(\$44.9)	(\$16.8)	\$12.6	\$43.0	
19	<b>Discounted CF</b>	(\$100.0)	\$24.4	\$22.2	\$20.0	\$18.7	\$17.2	\$2.5
20	<b>Cumulative Discounted CF</b>	(\$100.0)	(\$75.6)	(\$53.4)	(\$33.5)	(\$14.7)	\$2.5	
21	<b>Discounted Taxes</b>	\$0.0	\$4.3	\$3.8	\$3.4	\$3.3	\$3.0	\$17.8
22	<b>PV Income Before Tax</b>	\$0.0	\$12.6	\$11.7	\$10.6	\$10.5	\$10.0	\$55.4

=SLN(cost,salvage,life).

# Sources of Industry Information

- **Networking**
  - Business partners, customers, suppliers, colleagues at other firms
- **General business media and Internet**
  - Reliability?
- **Annual reports**
- **Government agencies**
- **Credit rating agencies**

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**Part 1**

**Domain C: Business Partnering**

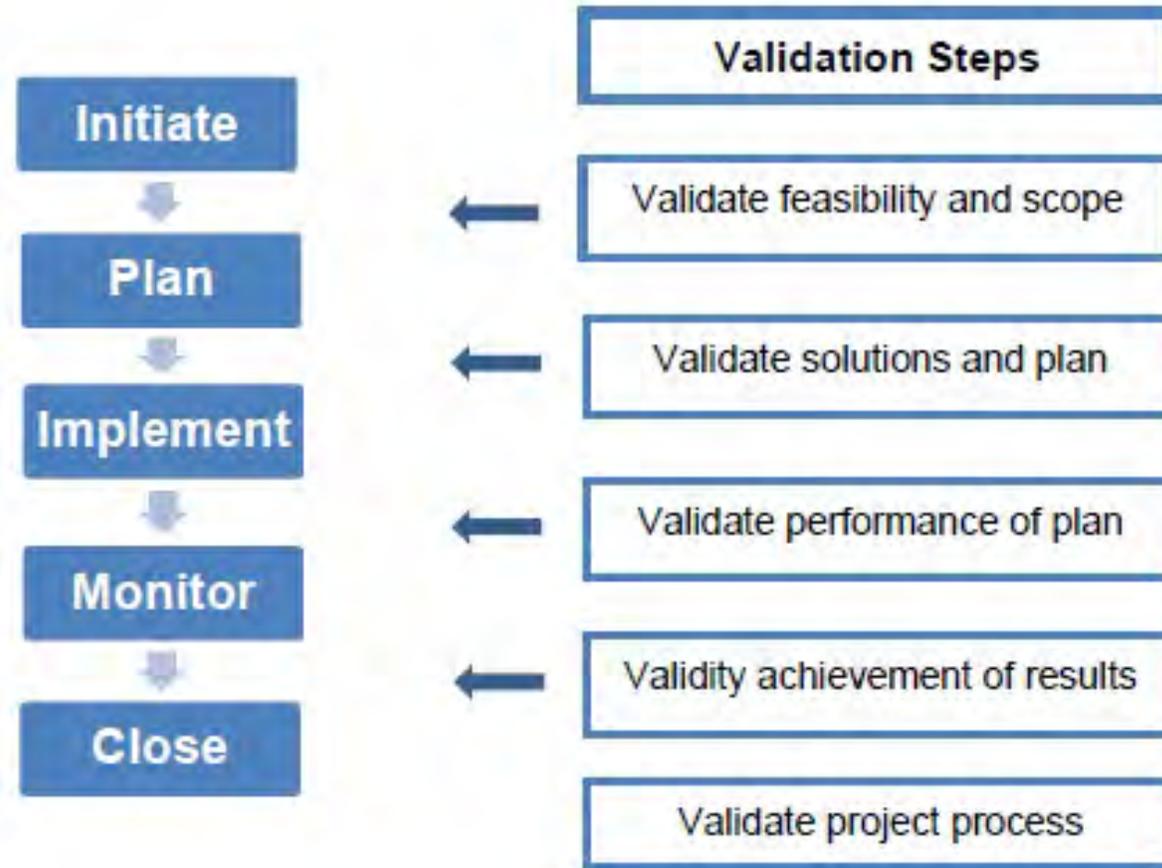
**Chapter 13: Managing FP&A  
Projects**

# Managing FP&A Projects

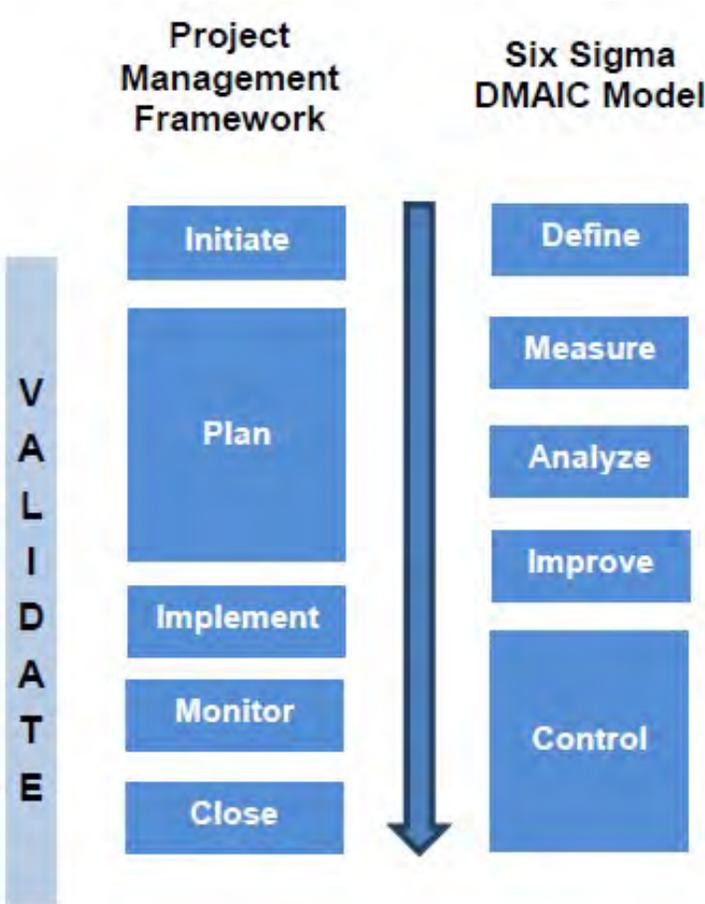
## *Topics Overview*

- *Initiate a Project*
- *Plan a Project*
- *Implement a Project*
- *Monitor a Project*
- *Close a Project*

# Project Management



# Six Sigma Strategy



# Total Quality Management and Continuous Improvement

- Aimed toward a quality-oriented culture
- Focused on customer expectations
- Involves everyone in the organization
- A continuous learning process



# Project Management Terminology

Bottleneck

Change control

Charter

Critical path method

Deliverable

Dependent task

DMAIC

Gantt chart

PERT chart

Phase-gate meeting

Post-mortem

Punch list

Scope

Scope creep

Task

Work breakdown structure

# Initiate Project

**Scope of project**

**Time and resources available**

**Project charter: Describes the project manager's understanding of the project.**

**Additional aspects of the charter:**

- **Authorization from client/stakeholder, delegation of power to request and direct resources, scope-of-work statement, assumptions, approximate cost**

# Plan Project

**Work breakdown structure (WBS) or project design: Influences scheduling, staffing, and budgeting**

**Budget human capital and financial capital**

- Who are the “influencers”?

**Project schedule**

- Critical path method (CPM) and program evaluation and review techniques (PERT): similar methods used to sequence dependent paths and used to find the most efficient path

**Key goals: Quality assurance, risk management, and effective communication**

# CPM/PERT

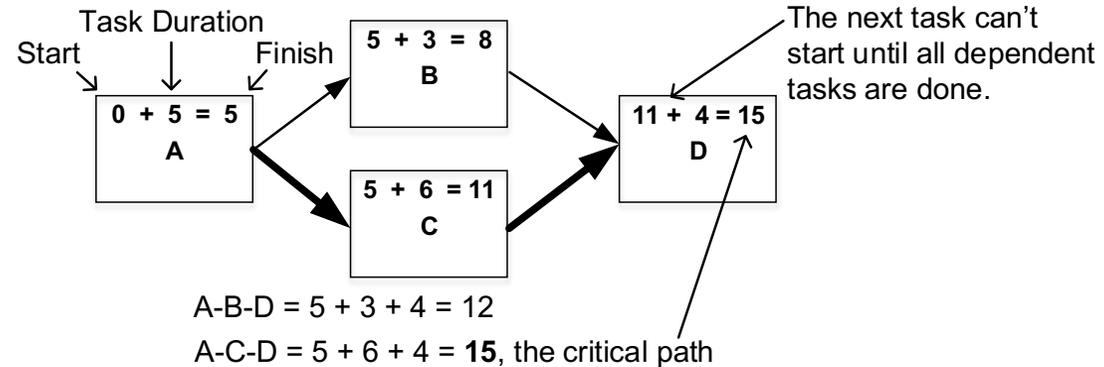
**Be able to differentiate between dependent and independent tasks**

**Critical path is defined as the sequence of activities with the longest duration to complete**

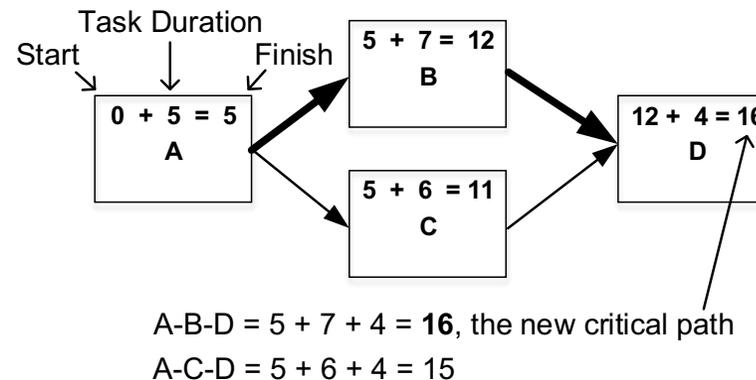
- This is the shortest possible completion time for the project

# Project Schedule: Critical Path Method

Sum task durations to find critical path (longest).



If a task duration changes, there may be a new critical path.



# Project Schedule: Gantt Chart



# Implement Project

**Implementation involves activating the planned decisions**

## **Key issues:**

- Status reports
- Project meetings
- Motivation
- Problem solving
- Conflict management
  - Forcing, Accommodating, Avoiding, Compromising, Collaborating

# Monitor Project

**Review project metrics/KPIs and/or dashboards**

**Beware “scope creep”**

- Change management can help in this regard
- Requires that a change request form be filled out each time a change is recommended

# Close Project

## Formal or informal turnover of project

- Before turning project over review a punch list

## Review the process

- Debriefing and post mortem (i.e., “institutionalizing” the knowledge)

## **Part 2**

# **Domain A: Analysis and Projections**

## **Chapter 1: Sales Volume and Revenue Projections**

# Sales Volume and Revenue Projections

## *Topics Overview*

- *Time Series Analyses*
- *Smoothing Techniques*
- *Regression Techniques*
- *Seasonality*

# Factors that can influence sales volume levels:



# Forecast Methods

Two main forecast categories:

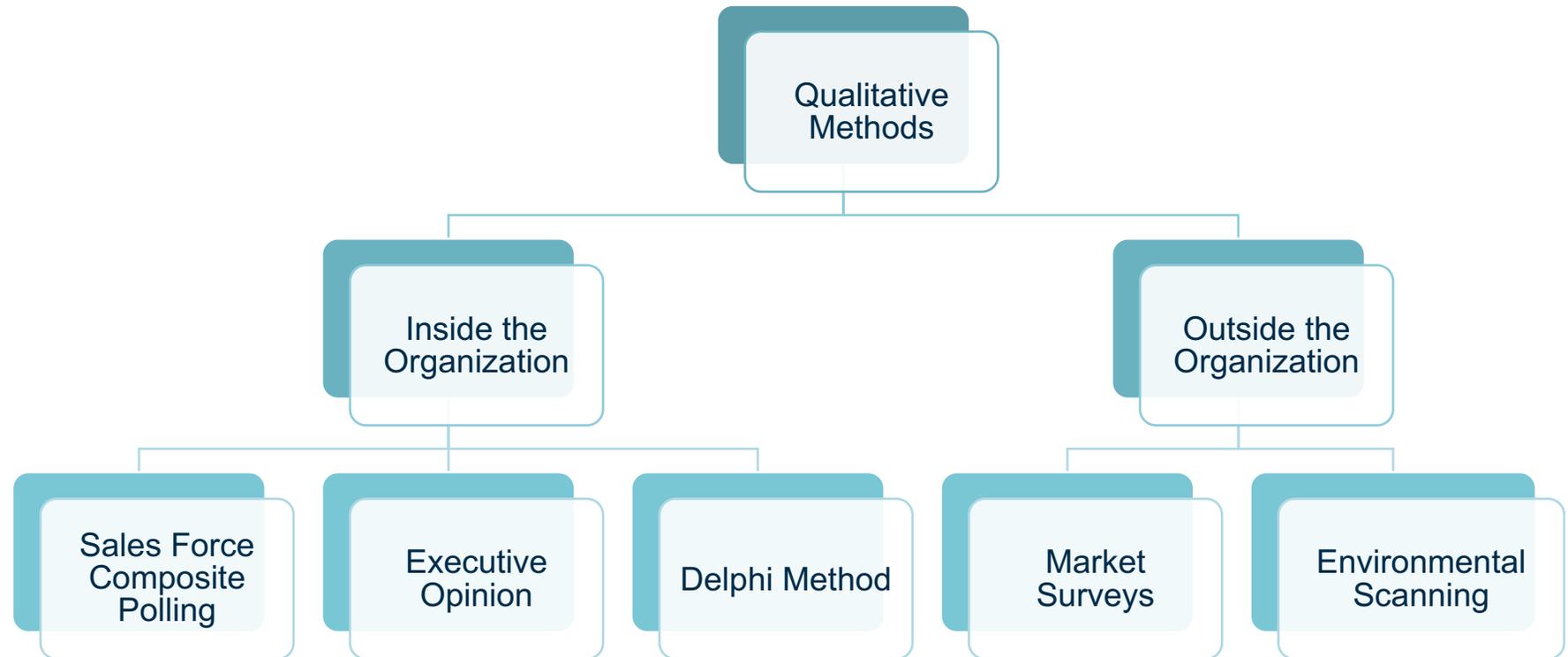
Qualitative



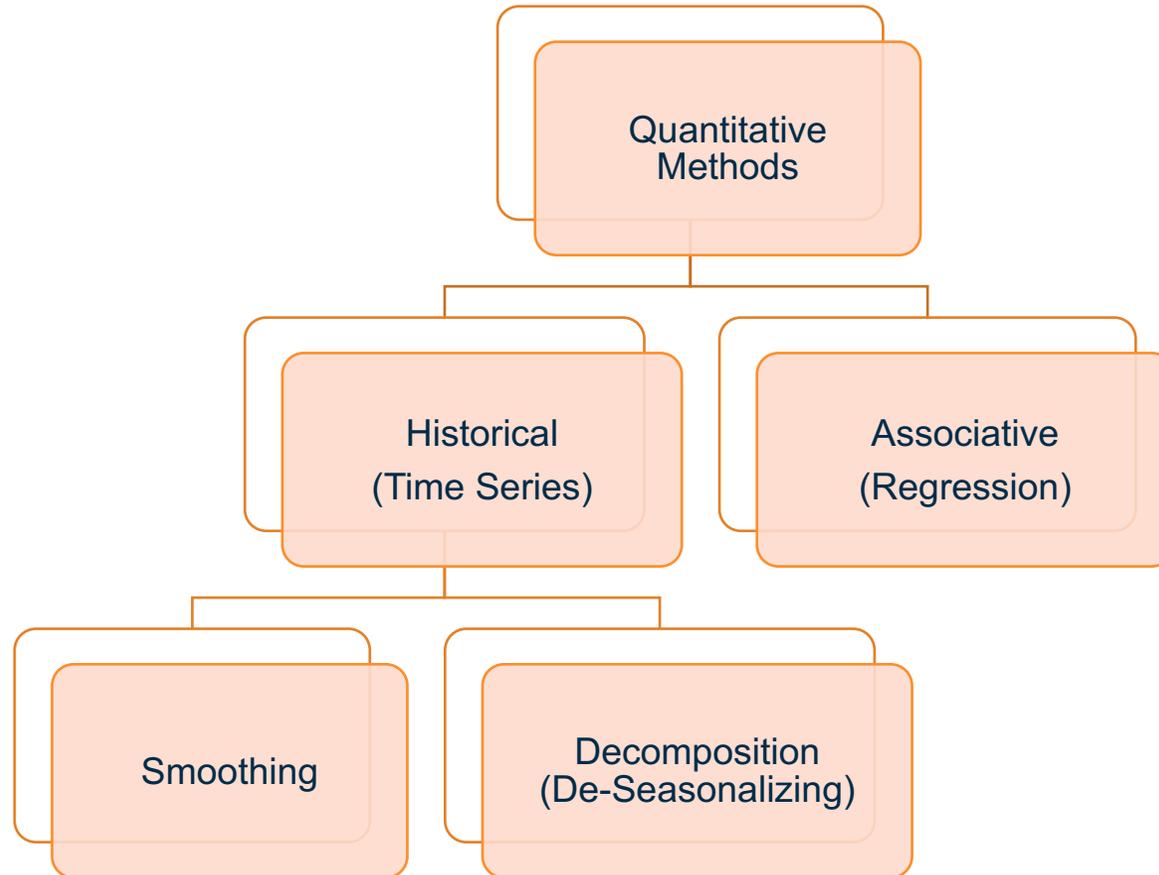
Quantitative



# Qualitative Methods



# Quantitative Methods



# Segmentation



# Components of Time Series

The four components of time series data:

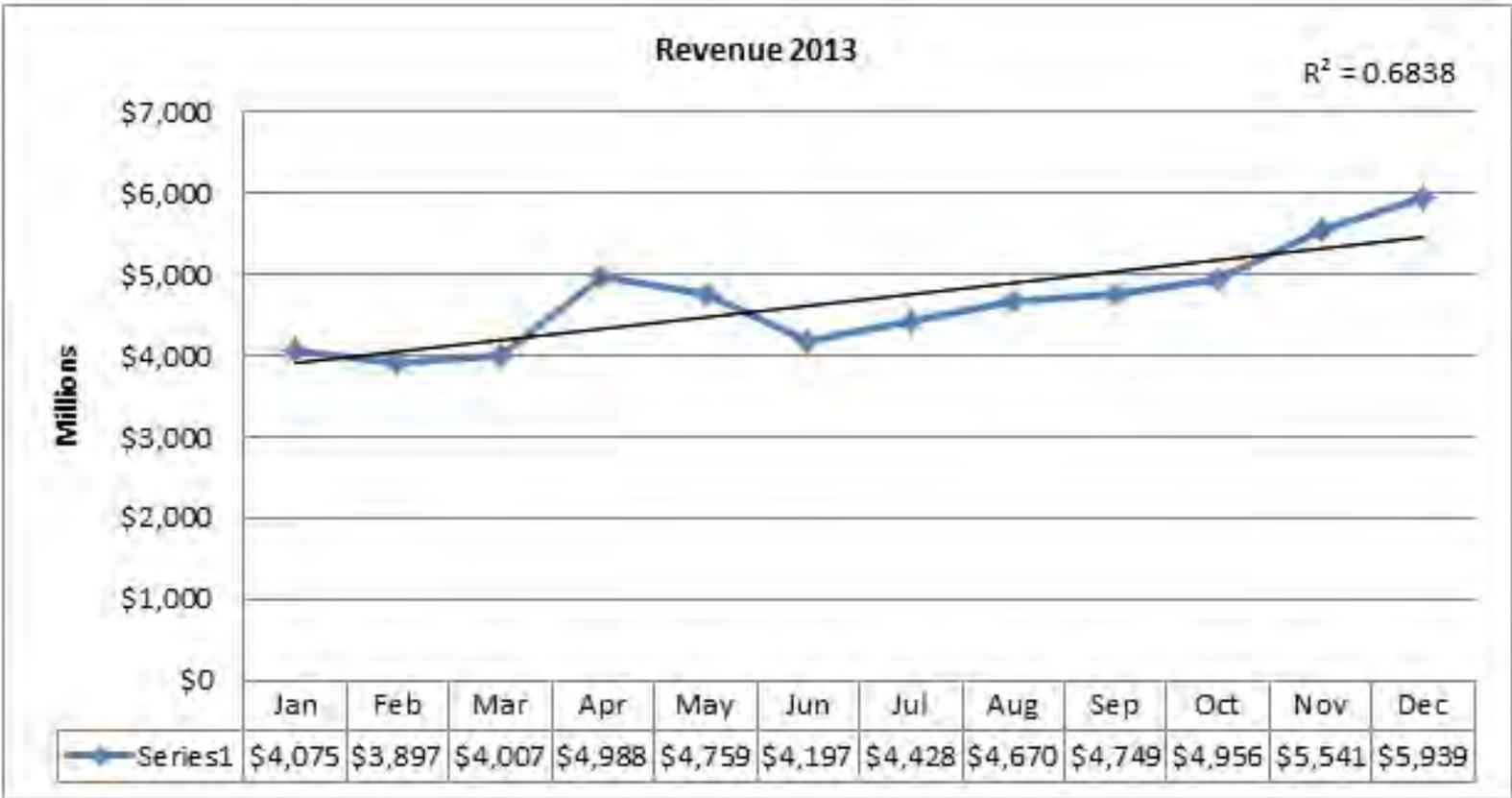
Secular trend ( $T_t$ ).

Cyclical variation ( $C_t$ ).

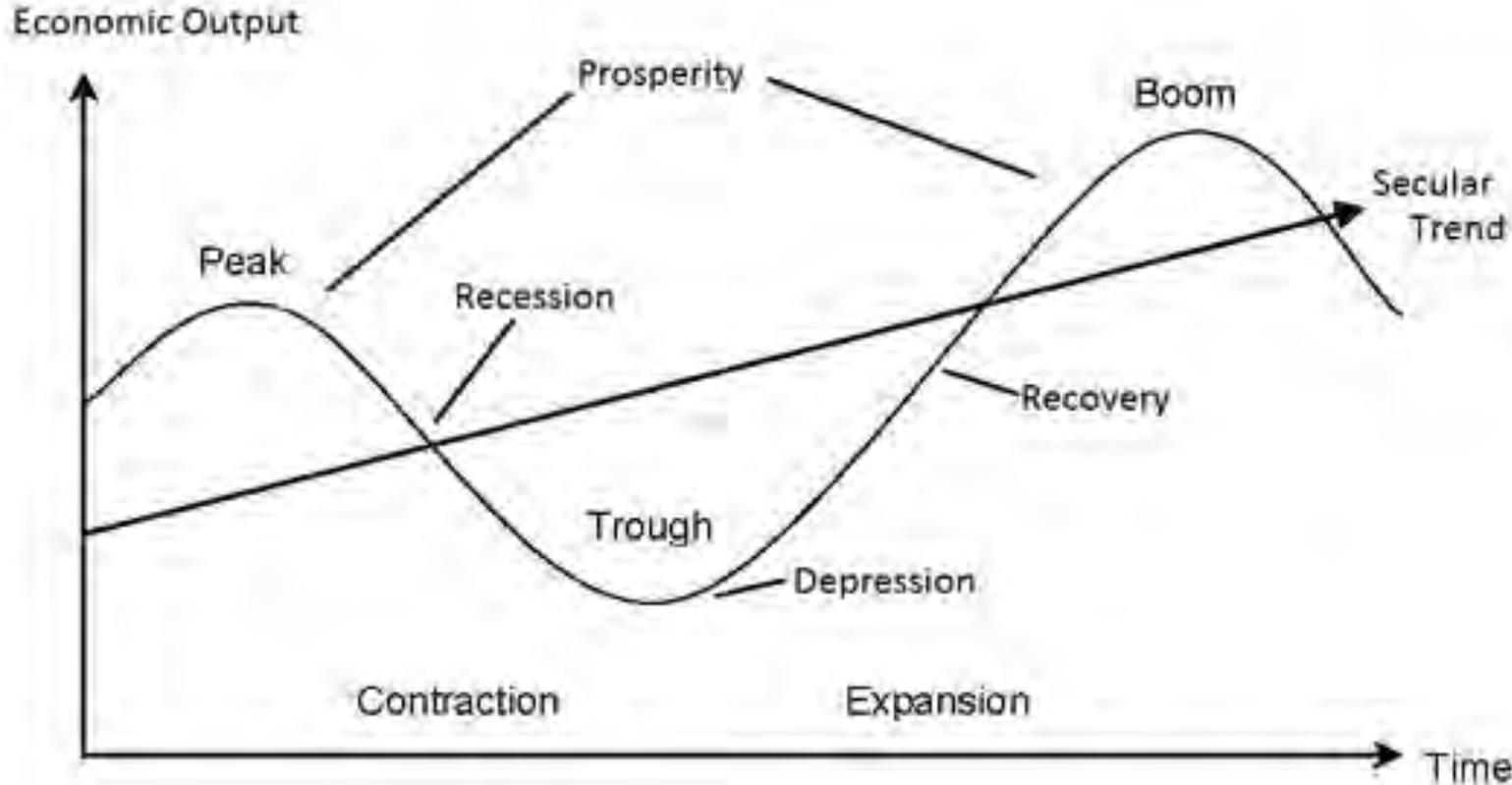
Seasonal variation ( $S_t$ ).

Irregular variation ( $I_t$ ).

# Time Series Data: Secular Trend



# Time Series Data: Cyclical Variation



# Time Series Data: Seasonal Variation



Christmas



New car

# Time Series Data: Irregular Variation

Episodic fluctuations are unpredictable but identifiable, such as a downturn in sales in the wake of a product safety recall.



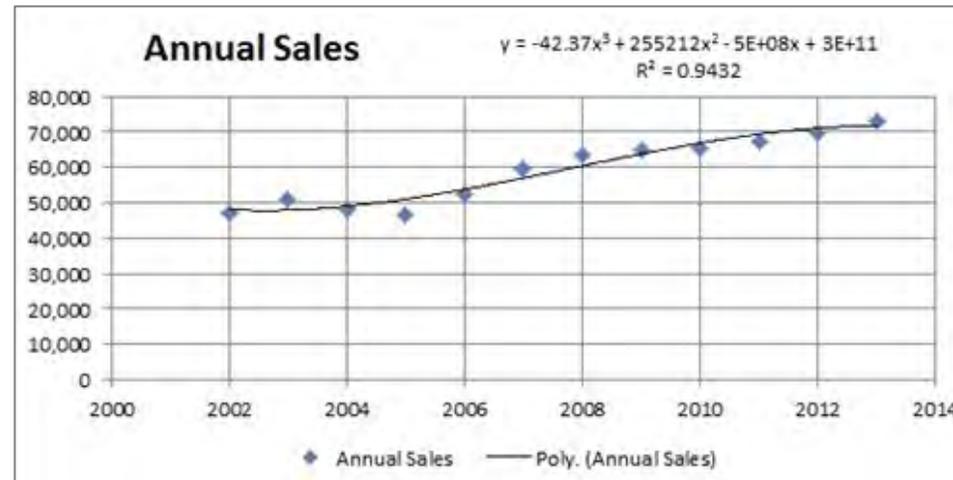
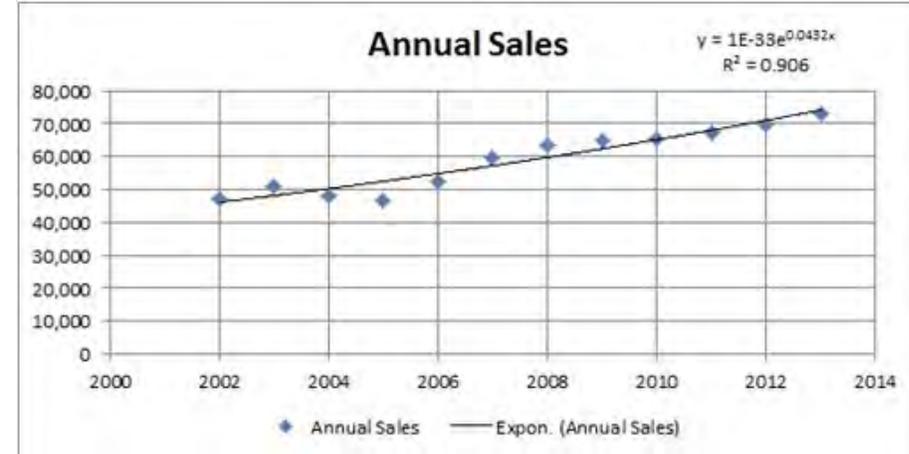
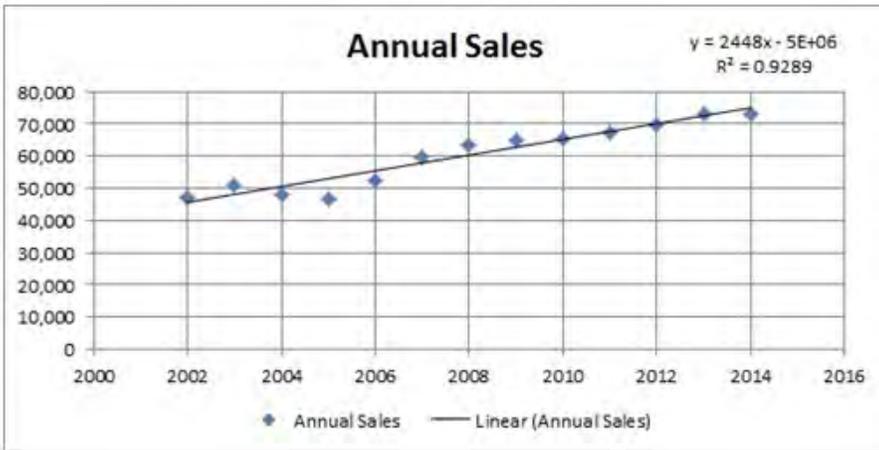
Residual fluctuations are both unpredictable and unidentifiable; they are also called chance fluctuations and are what remain when the episodic variations are removed.



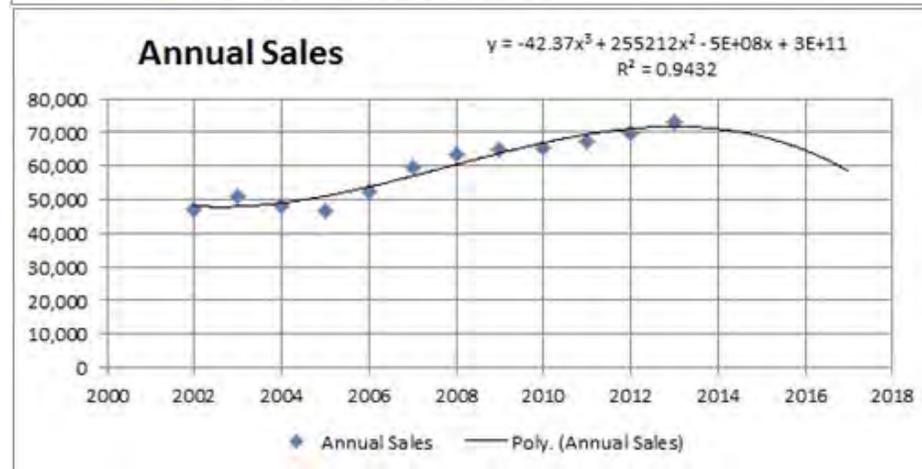
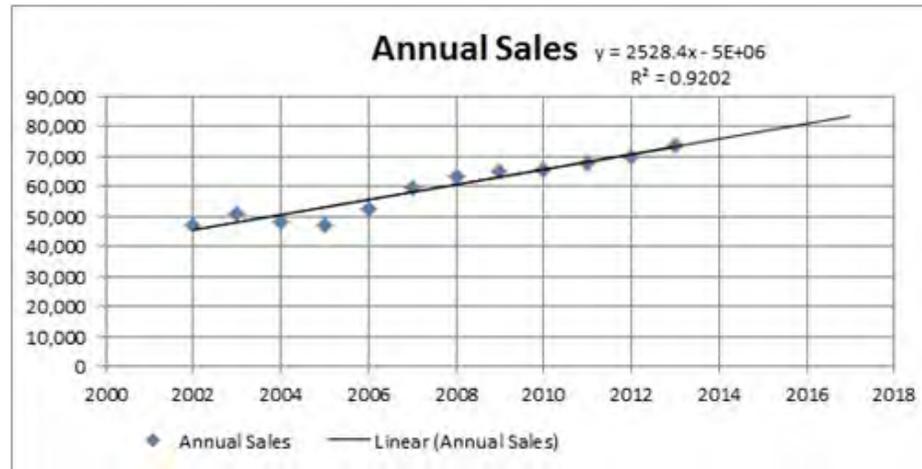
# Time Series Decomposition and Forecasting



# Defining the Trend Line



# Linear vs. Polynomial Trend Line 4-Year Projections



# Metrics for Measuring Accuracy of a Trend Line

Coefficient of Determination ( $R^2$ )

Correlation Coefficient ( $r$ )

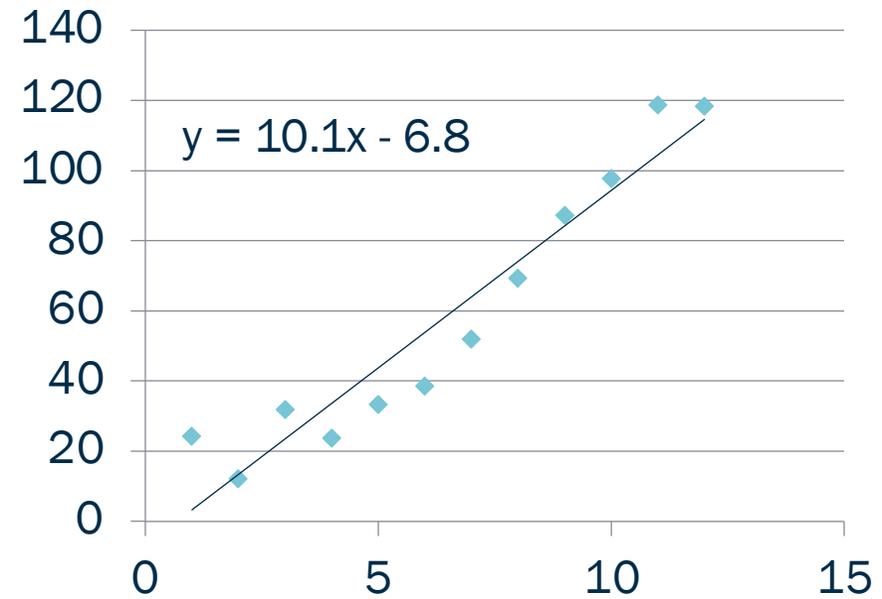
Mean Absolute Deviation (MAD)

Mean Squared Deviation (MSD)

# Metrics: MAD and MSD

$t$	Actual Value	Fitted Value	Absolute Deviation	Squares of the Absolute Deviation	
1	98	86.53	11.47	131.5609	
2	105	101.63	3.37	11.3569	
3	116	116.73	0.73	0.5329	
4	119	131.83	12.83	164.6089	
5	135	146.93	11.93	142.3249	
6	156	162.03	6.03	36.3609	
7	177	177.13	0.13	0.0169	
8	208	192.23	15.77	248.6929	
			SUM	62.26	735.4552
			<b>MAD = 7.7825</b>	<b>MSD = 91.9319</b>	

# Excel and Trend Lines



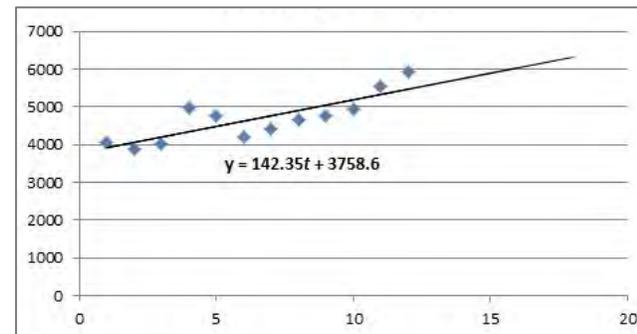
# Smoothing Techniques

Two main approaches to finding the best-fit trend line:

Starting from the raw data – Smoothing techniques, such as weighted moving averages, are then employed to smooth away the fluctuations in the data by using their arithmetic mean values and “moving” them through the time series.

	Sales	Moving Average	Weighted Moving Average
Jan	\$4,075		
Feb	\$3,897		
Mar	\$4,007	\$3,993	\$3,982 = (4,075 * 0.17) + (3,897 * 0.33) + (4,007 * 0.5)
Apr	\$4,988	\$4,298	\$4,479
May	\$4,759	\$4,585	\$4,707
Jun	\$4,197	\$4,648	\$4,517
Jul	\$4,428	\$4,461	\$4,408
Aug	\$4,670	\$4,432	\$4,510
Sep	\$4,749	\$4,616	\$4,669
Oct	\$4,956	\$4,792	\$4,839 = (4,670 * 0.17) + (4,749 * 0.33) + (4,956 * 0.5)
Nov	\$5,541	\$5,082	\$5,213
Dec	\$5,939	\$5,479	\$5,641

Starting from the mathematical slope-intercept equation of the trend line – Regression techniques such as the least-squares method are then employed to further refine the slope and intercept values, which can then be used to calculate the value of a future point along the trend line.

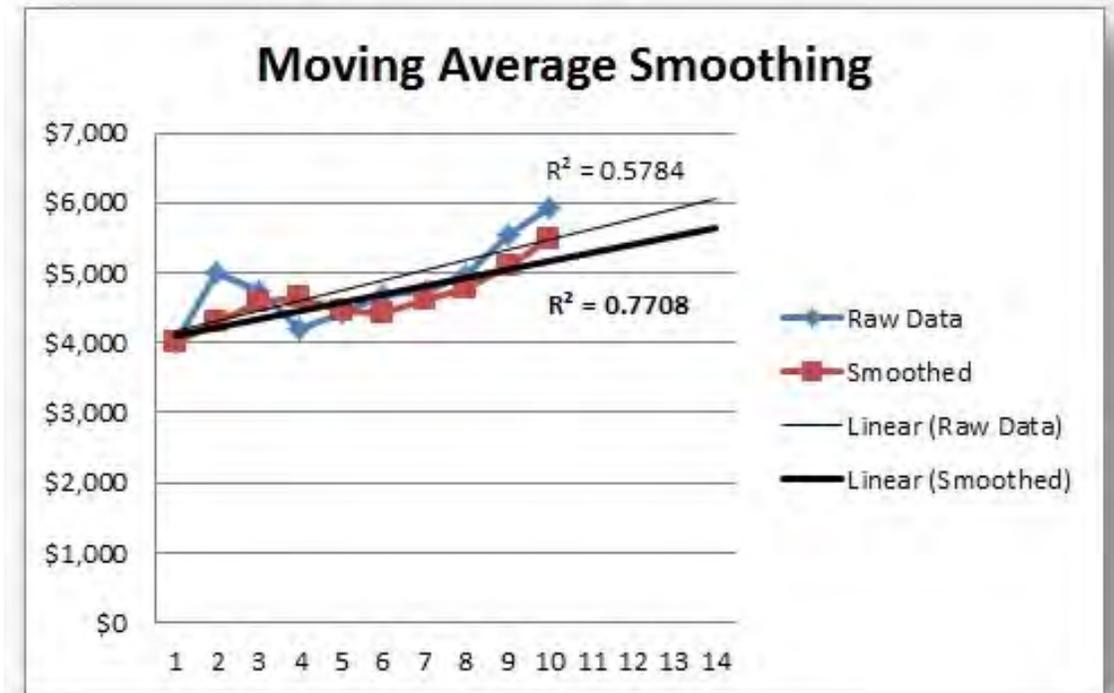


# Moving Average Method

## Raw Data

	Sales	Moving Average	
Jan	\$4,075		
Feb	\$3,897		
Mar	\$4,007	\$3,993	= (Jan + Feb + Mar) / 3
Apr	\$4,988	\$4,298	
May	\$4,759	\$4,585	
Jun	\$4,197	\$4,648	
Jul	\$4,428	\$4,461	
Aug	\$4,670	\$4,432	
Sep	\$4,749	\$4,616	
Oct	\$4,956	\$4,792	= (Aug + Sep + Oct) / 3
Nov	\$5,541	\$5,082	
Dec	\$5,939	\$5,479	

## Results



# Weighted Moving Averages

	Sales	Moving Average	Weighted Moving Average	
Jan	\$4,075			
Feb	\$3,897			
Mar	\$4,007	\$3,993	\$3,982	$= (4,075 * 0.17) + (3,897 * 0.33) + (4,007 * 0.5)$
Apr	\$4,988	\$4,298	\$4,479	
May	\$4,759	\$4,585	\$4,707	
Jun	\$4,197	\$4,648	\$4,517	
Jul	\$4,428	\$4,461	\$4,408	
Aug	\$4,670	\$4,432	\$4,510	
Sep	\$4,749	\$4,616	\$4,669	
Oct	\$4,956	\$4,792	\$4,839	$= (4,670 * 0.17) + (4749 * 0.33) + (4,956 * 0.5)$
Nov	\$5,541	\$5,082	\$5,213	
Dec	\$5,939	\$5,479	\$5,641	

# Exponential Smoothing

The formula for simple exponential smoothing is:

$$Y'_{t+1} = \alpha Y_t + (1 - \alpha) Y'_t$$

Where:

$Y'_{t+1}$  = the exponentially smoothed average to  
be used as the forecast for the next period

$Y_t$  = the most recent actual data

$Y'_t$  = the most recent smoothed forecast value

$\alpha$  = the smoothing constant

# Least Squares Method

The least squares formulas for defining the best-fit line by its slope and intercept are as follows:

Least squares formula for slope: 
$$b = \frac{n \sum tY - (\sum Y)(\sum t)}{n \sum t^2 - (\sum t)^2}$$

Least squares formula for y-intercept: 
$$a = \frac{\sum Y}{n} - b \left( \frac{\sum t}{n} \right)$$

# Computations Needed for Least Squares Trend Equations

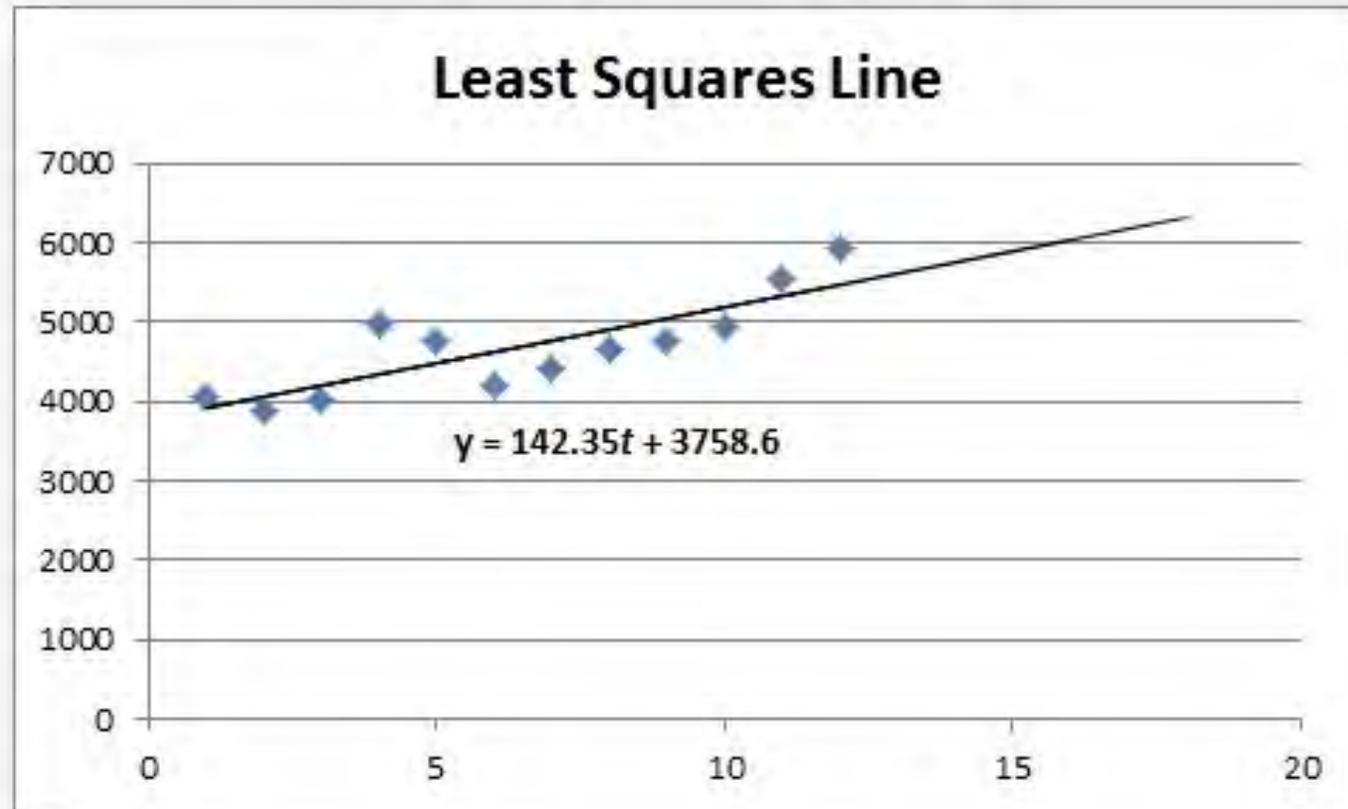
	Sales (millions)			
	<i>Y</i>	<i>t</i>	<i>tY</i>	<i>t</i> <sup>2</sup>
Jan	4075	1	4075	1
Feb	3897	2	7794	4
Mar	4007	3	12022	9
Apr	4988	4	19953	16
May	4759	5	23794	25
Jun	4197	6	25181	36
Jul	4428	7	30997	49
Aug	4670	8	37359	64
Sep	4749	9	42745	81
Oct	4956	10	49556	100
Nov	5541	11	60954	121
Dec	5939	12	71270	144
<b>TOTAL</b>	<b>56207</b>	<b>78</b>	<b>385702</b>	<b>650</b>

# Least Squares Slope (b) and Intercept (a) Calculations

$$b = \frac{n \sum tY - (\sum Y)(\sum t)}{n \sum t^2 - (\sum t)^2} = \frac{12(385702) - 56207(78)}{12(650) - 6084} = \frac{4628424 - 4384146}{7800 - 6084} = \frac{244278}{1716} = 142.35$$

$$a = \frac{\sum Y}{n} - b \left( \frac{\sum t}{n} \right) = \frac{56207}{12} - 142.35 \left( \frac{78}{12} \right) = 4683.91 - 925.27 = 3758.64$$

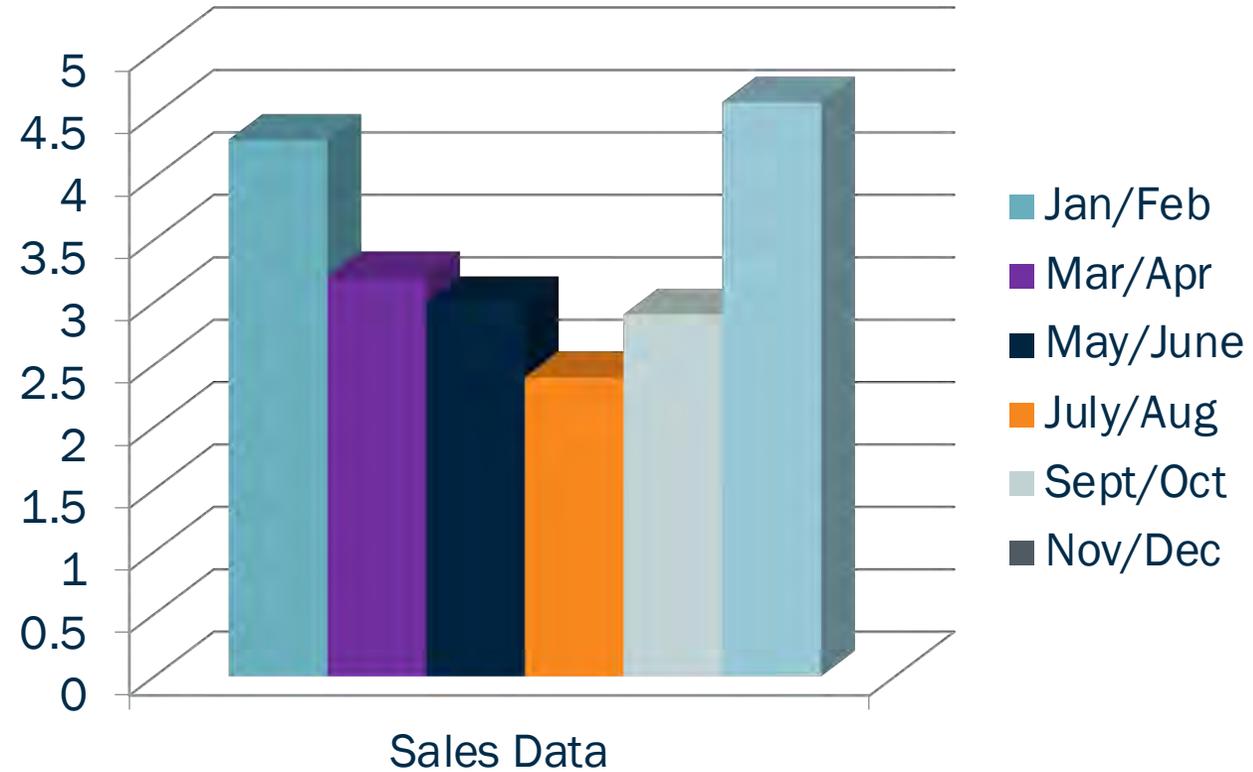
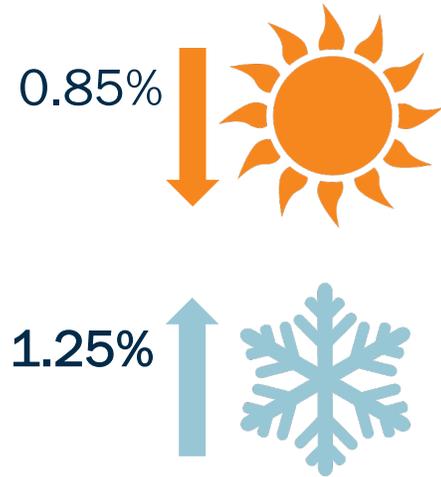
# Least Squares Slope (b) and Intercept (a) Calculations



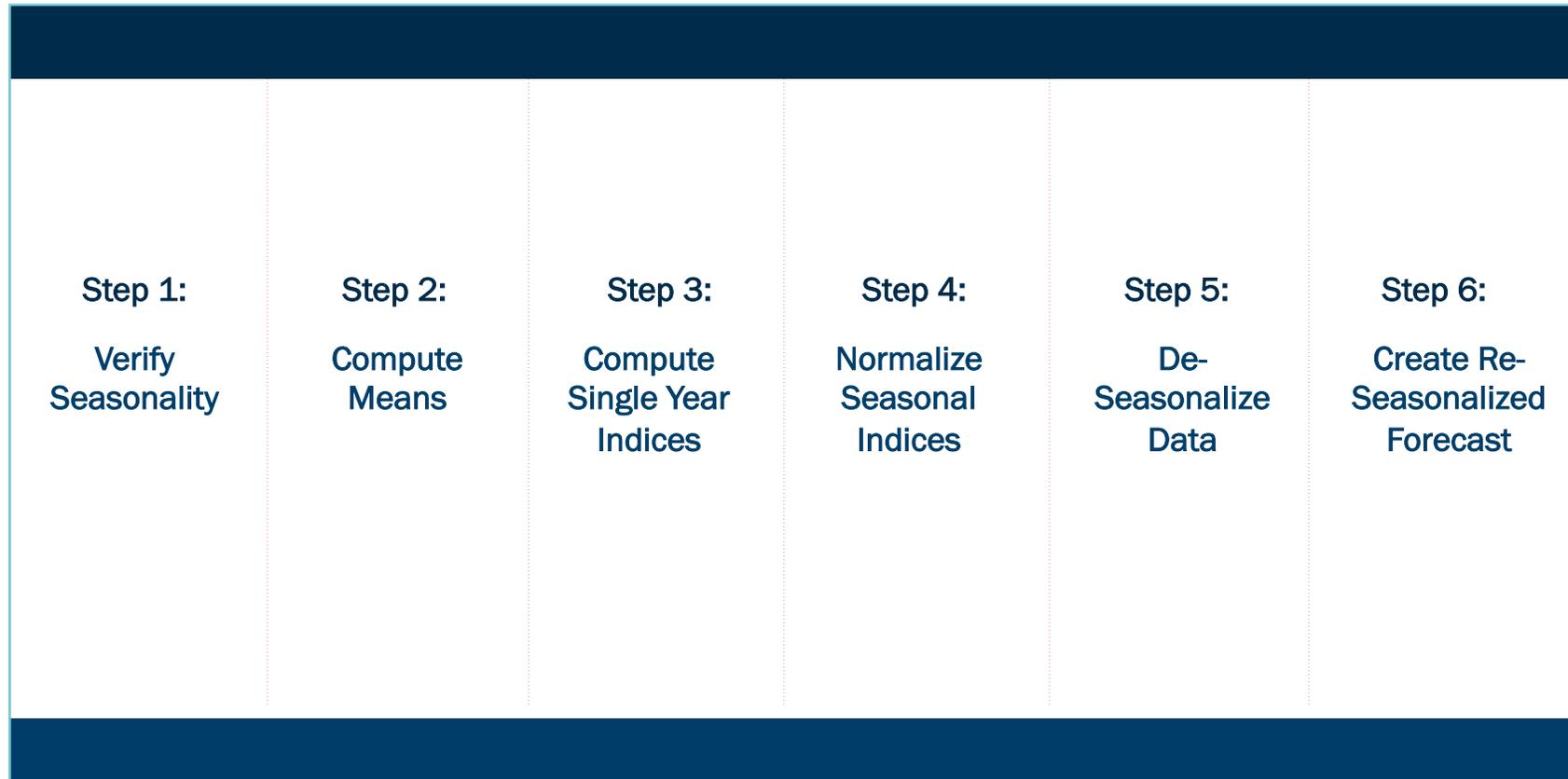
# Seasonality



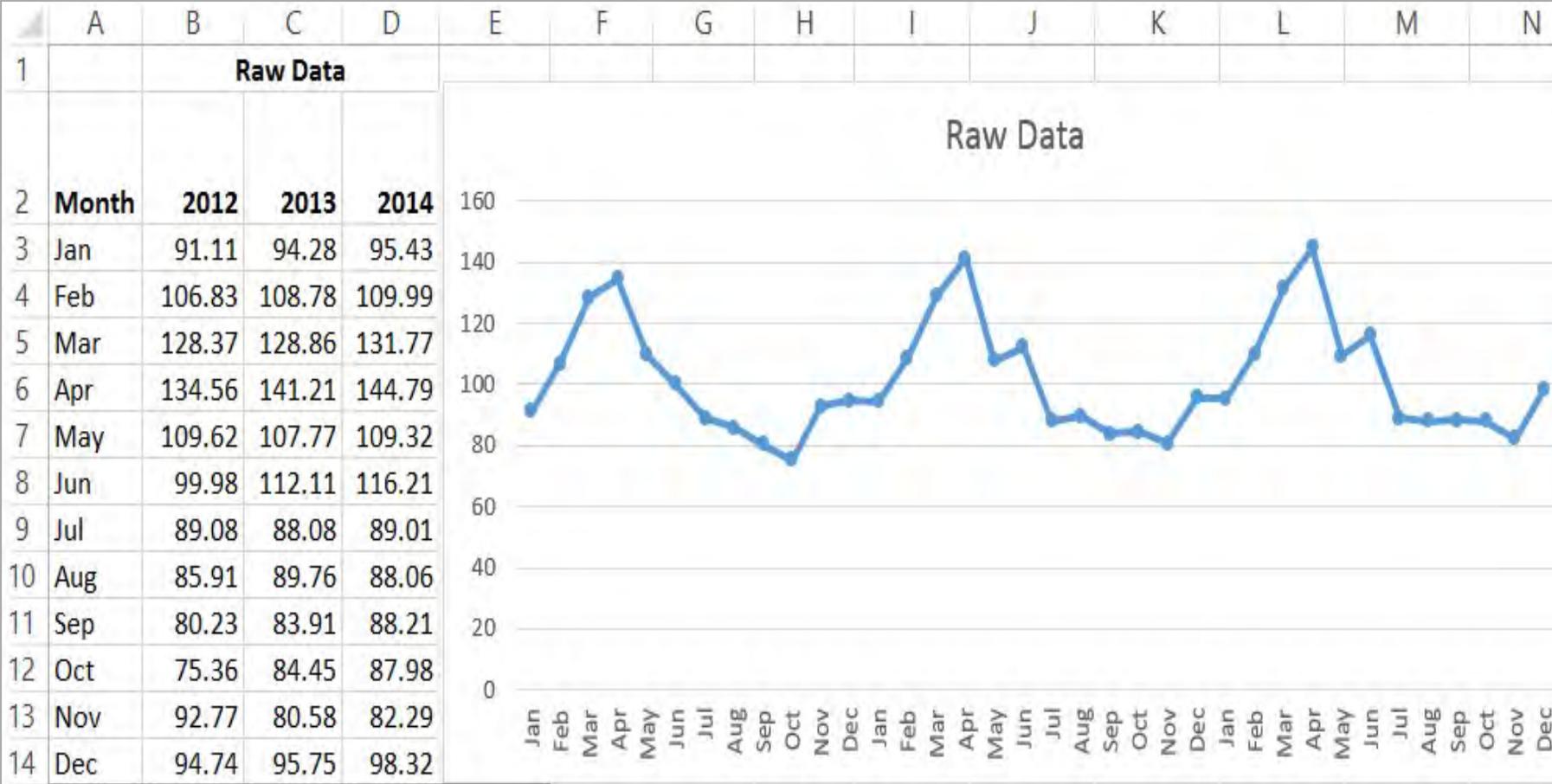
# Seasonal Index



# De-Seasonalizing Data



# Step 1: Verify Seasonality



## Step 2: Compute Means

The mean is obtained by summing the monthly values and then dividing by the number of values.



Month	2012	2013	2014
Jan	91.11	94.28	95.43
Feb	106.83	108.78	109.99
Mar	128.37	128.86	131.77
Apr	134.56	141.21	144.79
May	109.62	107.77	109.32
Jun	99.98	112.11	116.21
Jul	89.08	88.08	89.01
Aug	85.91	89.76	88.06
Sep	80.23	83.91	88.21
Oct	75.36	84.45	87.98
Nov	92.77	80.58	82.29
Dec	94.74	95.75	98.32
<b>SUM</b>	<b>1188.6</b>	<b>1215.5</b>	<b>1241.4</b>
<b>Year</b>			
<b>Average</b>	<b>99.05</b>	<b>101.30</b>	<b>103.45</b>

=

$$\frac{\text{monthly values}}{\text{\# of values}}$$

# Step 3: Compute Single Year Indices

=AVERAGE(\$F3:\$H3)									
	A	B	C	D	E	F	G	H	I
1	Raw Data								
2	Month	2012	2013	2014	Month Average	2012 Index	2013 Index	2014 Index	Average Seasonal Index
3	Jan	91.11	94.28	95.43	93.61	0.920	0.931	0.922	0.924
4	Feb	106.83	108.78	109.99	108.53	1.079	1.074	1.063	1.072
5	Mar	128.37	128.86	131.77	129.67	1.296	1.294	1.274	1.281
6	Apr	134.56	141.21	144.79	140.19	1.359	1.394	1.378	1.384
7	May	109.62	107.77	109.32	108.90	1.107	1.064	1.072	1.076
8	Jun	99.98	112.11	116.21	109.43	1.009	1.107	1.107	1.074
9	Jul	89.08	88.08	89.01	88.72	0.899	0.870	0.866	0.878
10	Aug	85.91	89.76	88.06	87.91	0.867	0.874	0.866	0.869
11	Sep	80.23	83.91	88.21	84.12	0.810	0.874	0.866	0.847
12	Oct	75.36	84.45	87.98	82.60	0.761	0.874	0.866	0.814
13	Nov	92.77	80.58	82.29	85.21	0.937	0.874	0.866	0.892
14	Dec	94.74	95.75	98.32	96.27	0.957	0.874	0.866	0.912
15	SUM	1188.6	1215.5	1241.4	1215.16				
16	Year Average	99.05	101.30	103.45	101.26				

$$\text{Single Year Monthly Index} = \frac{\text{Month Data}}{\text{Year Average}}$$

$$= \frac{91.11}{99.05} = 0.920$$

# Step 4: Normalize Seasonal Indices

Raw Data									
Month	2012	2013	2014	Month Average	2012 Index	2013 Index	2014 Index	Average Seasonal Index	
Jan	91.11	94.28	95.43	93.61	0.920	0.931	0.922	0.924	
Feb	106.83	108.78	109.99	108.53	1.079	1.074	1.063	1.072	
Mar	128.37	128.86	131.77	129.67	1.296	1.272	1.274	1.281	
Apr	134.56	141.21	144.79	140.19	1.359	1.394	1.400	1.384	
May	109.62	107.77	109.32	108.90	1.107	1.064	1.064	1.075	
Jun	99.98	112.11	116.21	109.43	1.009	1.107	1.107	1.074	
Jul	89.08	88.08	89.01	88.72	0.899	0.899	0.899	0.899	
Aug	85.91	89.76	88.06	87.91	0.899	0.899	0.899	0.899	
Sep	80.23	83.91	88.21	84.11	0.899	0.899	0.899	0.899	
Oct	75.36	84.45	87.98	82.60	0.899	0.899	0.899	0.899	
Nov	92.77	80.58	82.29	85.18	0.899	0.899	0.899	0.899	
Dec	94.74	95.75	98.32	96.27	0.899	0.899	0.899	0.899	
<b>SUM</b>	<b>1188.6</b>	<b>1215.5</b>	<b>1241.4</b>	<b>1181.7</b>					
<b>Year Average</b>	<b>99.05</b>	<b>101.30</b>	<b>103.45</b>	<b>101.27</b>					

$$\begin{aligned}
 \text{Average Seasonal Index} &= \frac{\text{Sum of Single Year Indices}}{\text{Number of Years}} \\
 &= \frac{0.920 + 0.931 + 0.922}{3} = 0.924
 \end{aligned}$$

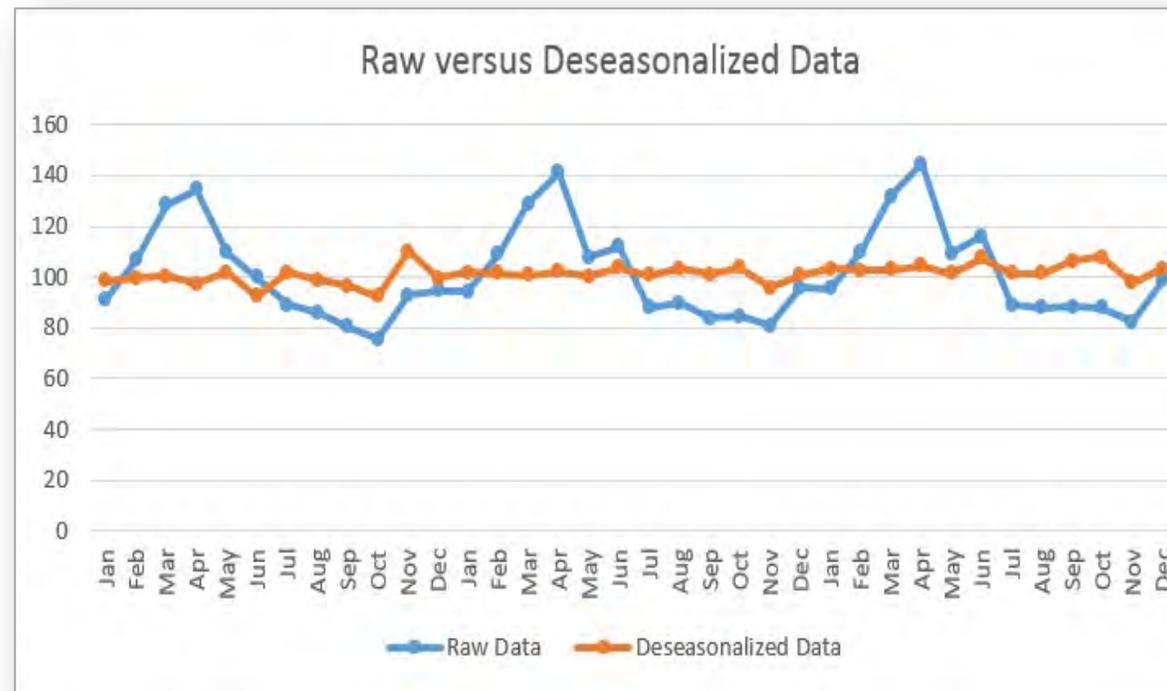
# Step 5: De-Seasonalize Data

	I	J	K	L
	<b>Deseasonalized Data</b>			
<b>Average Seasonal Index</b>				
	<b>2012</b>	<b>2013</b>	<b>2014</b>	
0.924	98.56	101.99	103.24	
1.072	99.66	101.11	102.61	
1.281	100.24	100.62	101.11	
1.384	97.22	102.02	104.61	
1.076	101.90	100.18	101.62	
1.080	92.59	103.82	107.62	
0.876	101.64	100.50	101.56	
0.868	98.95	103.38	101.42	
0.830	96.62	101.05	106.23	
0.815	92.47	103.62	107.95	
0.843	110.11	95.64	97.67	
0.951	99.65	100.71	103.41	

$$\text{De-seasonalized data} = \frac{\text{Raw Data Value}}{\text{Month's Seasonal Index}}$$

$$= \frac{91.11}{0.924} = 98.56$$

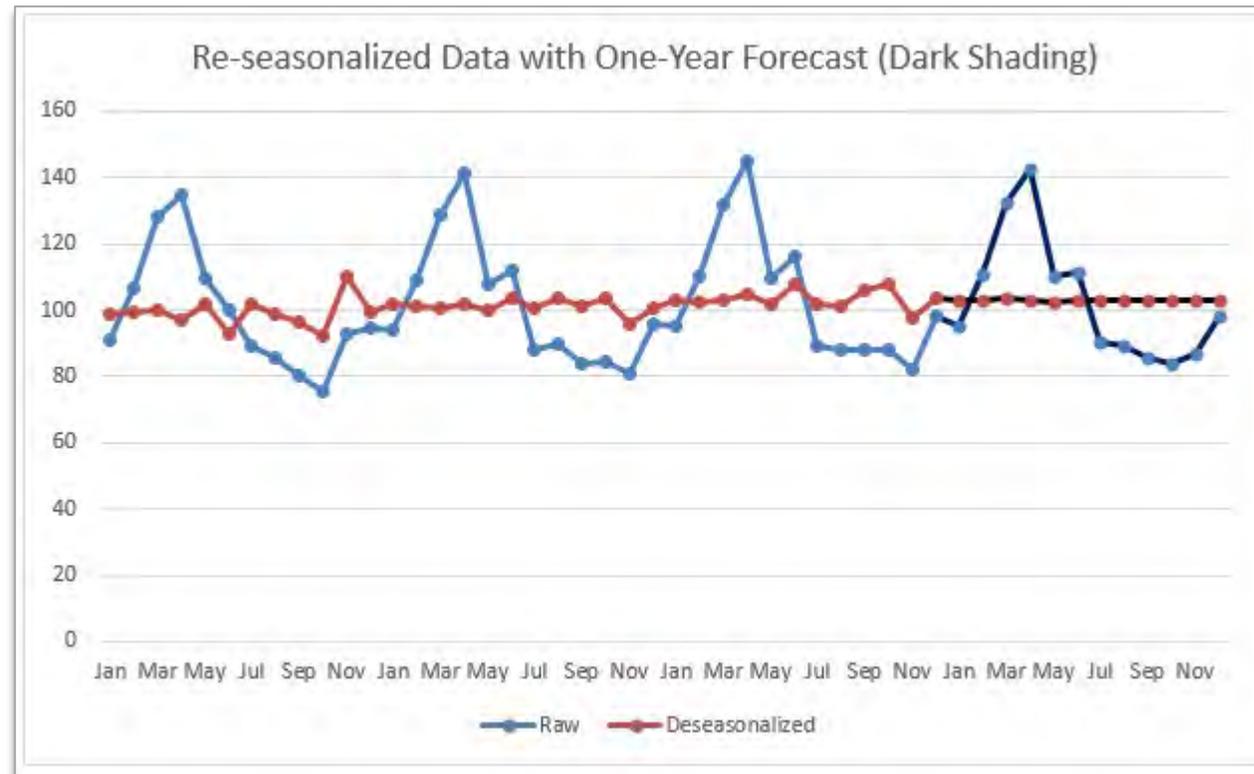
# Raw and De-Seasonalized Data Chart



# Step 6: Create Re-Seasonalized Forecast

I	J	K	L	M	N
	<b>De-seasonalized Data</b>				
<b>Average Seasonal Index</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015 De-seasonalized Forecast</b>	<b>2015 Re-seasonalized Forecast</b>
0.924	98.56	101.99	103.24	103.04	95.25
1.072	99.66	101.48	102.61	103.29	110.71
1.281	100.24	100.62	102.89	103.60	132.67
1.384	97.22	102.02	104.61	103.16	142.78
1.076	101.90	100.18	101.62	102.36	110.12
1.080	92.59	103.82	107.62	103.14	111.38
0.876	101.64	100.50	101.56	103.10	90.36
0.868	98.95	103.38	101.42	103.11	89.52
0.830	96.62	101.05	106.23	103.08	85.59
0.815	92.47	103.62	107.95	102.99	83.94
0.843	110.11	95.64	97.67	102.96	86.75
0.951	99.65	100.71	103.41	103.06	97.99

# Re-Seasonalized Forecast Line Chart



## **Part 2**

# **Domain A: Analysis and Projections**

## **Chapter 2: Financial Statement Projections**

# Financial Statement Projections

## *Topics Overview*

- *Income Statement*
- *Balance Sheet*
- *Statement of Cash Flows*
- *Projections*
- *Analyzing and Using Projections*

# Importance of Financial Statement Projections

## Critical because...



- Essential to maintaining an organization's fiscal health and can help avoid having to take drastic measures



- Present an opportunity for refining and improving forecasting techniques and fine-tuning assumptions on which forecasts are built



- Short-term forecasts can provide critical information about seasonal and other short-term fluctuations and anomalies that become less obvious when the focus shifts to long-range trends

# Examine for...



It will examine, for each line item:

- What does the item include?
- Is there a key relationship with other statement values on which its projected value can be based?
- What additional factors then need to be examined, accounted for and incorporated if the forecasted value is to be based on data and assumptions that are reasonably complete and accurate?

# Process for Internal Financial Statement Projections

Income Statement	Balance Sheet	Statement of Cash Flows	
STEP 1. Forecast revenue (sales); use that to:			(continued)
<ul style="list-style-type: none"> <li>Forecast expenses (COGS, SG&amp;A)</li> <li>Calculate gross profit</li> </ul>			STEP 4. Based on resulting operating cash excess or deficit, determine financing needs or whether to increase cash or reduce debt:
STEP 2. Use Step 1 assumptions to forecast:			
	<ul style="list-style-type: none"> <li>Accounts receivable</li> <li>Inventory</li> <li>Accounts payable</li> <li>Accrued expenses</li> </ul>	Changes in working capital: <ul style="list-style-type: none"> <li>Accounts receivable</li> <li>Inventory</li> <li>Accounts payable</li> <li>Accrued expenses</li> </ul>	<ul style="list-style-type: none"> <li>Calculate interest expense/income</li> <li>Calculate income before tax</li> </ul> Assets: <ul style="list-style-type: none"> <li>Cash and cash equivalents</li> </ul> Liabilities: <ul style="list-style-type: none"> <li>Current portion of long-term debt</li> <li>Long-term debt</li> </ul> Shareholders' equity: <ul style="list-style-type: none"> <li>Common stock</li> <li>Additional paid-in capital</li> </ul> (Indicates any financing need) Financing activities: <ul style="list-style-type: none"> <li>Increase (decrease) in long-term debt</li> <li>Net cash flow from financing activities</li> </ul>
STEP 3. Forecast capital expenditures; use CAPEX forecast to:			
<ul style="list-style-type: none"> <li>Estimate depreciation</li> <li>Calculate EBIT</li> </ul>	Estimate fixed assets: <ul style="list-style-type: none"> <li>Gross PP&amp;E</li> <li>Accumulated depreciation</li> <li>Other assets</li> </ul>	Forecast: <ul style="list-style-type: none"> <li>Depreciation and amortization</li> <li>Investing activities</li> </ul>	STEP 5. Based on projected income before tax, calculate:
			<ul style="list-style-type: none"> <li>Income tax expense</li> </ul> Liabilities: <ul style="list-style-type: none"> <li>Income taxes payable</li> <li>Deferred income taxes</li> </ul> Operating activities: <ul style="list-style-type: none"> <li>Increase (decrease) in income taxes</li> </ul>
STEP 6. Based on all of the above:			
Calculate: <ul style="list-style-type: none"> <li>Net income</li> <li>Earnings per share</li> </ul>		Recalculate: <ul style="list-style-type: none"> <li>Net income</li> <li>Shareholders' equity</li> <li>Retained earnings</li> <li>Totals (assets and liabilities)</li> </ul>	Recalculate: <ul style="list-style-type: none"> <li>All net cash flows</li> <li>Ending cash</li> </ul>
STEP 7. Submit completed preliminary forecast to decision makers. Based on their new revenue and CAPEX determinations, repeat Steps 1–6.			

# The Income Statement

	A	D	E	F
1	<b>Income Statement</b>			
2	<b>ShopNow!</b>			
3	<i>(Millions)</i>			
4	<b>For the years ended December 31,</b>			
7		<b>2011</b>	<b>2012</b>	<b>2013</b>
8	<b>Revenue</b>	<b>\$33,669</b>	<b>\$46,227</b>	<b>\$56,206</b>
9	Cost of Goods Sold	21,673	32,647	36,161
10	<b>Gross Profit</b>	<b>\$11,996</b>	<b>\$13,580</b>	<b>\$20,045</b>
11	SG&A	7,320	9,847	13,694
12	<b>EBITDA</b>	<b>\$4,676</b>	<b>\$3,733</b>	<b>\$6,351</b>
13	Depreciation & Amortization	870	1,207	1,510
14	<b>EBIT</b>	<b>\$3,806</b>	<b>\$2,526</b>	<b>\$4,841</b>
15	Interest Expense	525	611	684
16	<b>Income Before Tax</b>	<b>\$3,281</b>	<b>\$1,915</b>	<b>\$4,157</b>
17	Income Tax Expense	984	575	1,247
18	<b>Net Income</b>	<b>\$2,297</b>	<b>\$1,340</b>	<b>\$2,910</b>
20	<b>Shares Issued and Outstanding</b>	1,000	1,000	1,000
21	<b>Earnings Per Share</b>	\$2.30	\$1.34	\$2.91

<b>Income Statement</b>			
<b>ShopNow!</b>			
<i>(Common Size - % of Sales)</i>			
	<b>2011</b>	<b>2012</b>	<b>2013</b>
29 <b>Revenue</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
30 Cost of Goods Sold	64%	71%	64%
31 <b>Gross Profit</b>	<b>36%</b>	<b>29%</b>	<b>36%</b>
32 SG&A	22%	21%	24%
33 <b>EBITDA</b>	<b>14%</b>	<b>8%</b>	<b>11%</b>
34 Depreciation & Amortization	3%	3%	3%
35 <b>EBIT</b>	<b>11%</b>	<b>5%</b>	<b>9%</b>
36 Interest Expense	2%	1%	1%
37 <b>Income Before Tax</b>	<b>10%</b>	<b>4%</b>	<b>7%</b>
38 Income Tax Expense	3%	1%	2%
39 <b>Net Income</b>	<b>7%</b>	<b>3%</b>	<b>5%</b>

# Revenue

Reflects the essential way the organization earns its money.

## Current Growth Rate

$$\frac{2013 \text{ Revenue} - 2012 \text{ Revenue}}{2012 \text{ Revenue}} = \frac{\$56,206 - \$46,227}{\$46,227} = 21.6\%$$

## Projected Revenue Value

$$\begin{aligned} \text{Prior Year Value} \times (1 + \text{Growth Rate}) &= \text{Current Year Value After Growth} \\ \$56,206 \times (1 + .0216) &= \$68,346 \end{aligned}$$

# Key Considerations

## Variables that can have a critical impact:

- Cost of raw materials/components and labor, utilities, machinery, etc.
- Competitive environment
- Production efficiency
- Customer demand
- Accounting practice
- Changing business mix
- Long-term contracts and revenue recognition

# EPS/Shares Issued and Outstanding

$$\text{EPS} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Average Outstanding Shares}}$$



# Balance Sheet Key Elements

- Assets
- Liabilities
- Shareholders' Equity

Balance Sheet					
ShopNow!					
(\$millions)					
As of December 31,					
	2011	2012	2013	Change in Balance Sheet	
				2011 to 2012	2012 to 2013
<b>ASSETS</b>					
Cash & Cash Equivalents	\$682	\$3,515	\$6,807	\$2,855	\$3,292
Accounts Receivable	5,008	5,083	6,082	75	999
Inventory	4,284	4,984	6,460	700	1,476
Other Current Assets	766	2,167	1,468	1,401	(699)
<b>Total Current Assets</b>	<b>\$10,740</b>	<b>\$15,749</b>	<b>\$20,817</b>	<b>\$5,009</b>	<b>\$5,068</b>
Gross PP&E	\$18,842	\$21,868	\$26,726	\$3,026	\$4,858
Accumulated Depreciation	5,066	6,273	7,783	1,207	1,510
<b>Net PP&amp;E</b>	<b>\$13,776</b>	<b>\$15,595</b>	<b>\$18,943</b>	<b>\$1,819</b>	<b>\$3,348</b>
Other Noncurrent Assets	\$1,224	\$1,642	\$1,813	\$418	\$171
<b>TOTAL ASSETS</b>	<b>\$25,740</b>	<b>\$32,986</b>	<b>\$41,573</b>	<b>\$7,246</b>	<b>\$8,587</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
<b>Current Liabilities</b>					
Accounts Payable	\$4,215	\$5,451	\$6,934	\$1,236	\$1,483
Current Portion of Long-Term Debt	879	1,016	606	137	(410)
Accrued Expenses	1,390	1,416	1,959	26	543
Income Taxes and Other	287	1,327	364	1,040	(963)
<b>Total Current Liabilities</b>	<b>\$6,771</b>	<b>\$9,210</b>	<b>\$9,863</b>	<b>\$2,439</b>	<b>\$653</b>
<b>Long Term Liabilities</b>					
Deferred Income Taxes and Other	\$1,305	\$1,996	\$2,412	\$691	\$416
Long-Term Debt	9,167	12,193	17,051	3,026	4,858
<b>Total Long Term Liabilities</b>	<b>\$10,472</b>	<b>\$14,189</b>	<b>\$19,463</b>	<b>\$3,717</b>	<b>\$5,274</b>
<b>Total Liabilities</b>	<b>\$17,243</b>	<b>\$23,399</b>	<b>\$29,326</b>	<b>\$6,156</b>	<b>\$5,927</b>
<b>Shareholders' Equity</b>					
Common Stock	\$68	\$68	\$68	\$0	\$0
Additional Paid-In Capital	1,130	1,130	1,130	0	0
Retained Earnings	7,299	8,389	11,049	1,090	2,660
<b>Shareholders' Equity</b>	<b>\$8,497</b>	<b>\$9,587</b>	<b>\$12,247</b>	<b>\$1,090</b>	<b>\$2,660</b>
<b>TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY</b>	<b>\$25,740</b>	<b>\$32,986</b>	<b>\$41,573</b>	<b>\$7,246</b>	<b>\$8,587</b>
Balance Check (OK or Error)	OK	OK	OK		

# Statement of Cash Flows

Reconciles the income statement and the balance sheets, combining net income and dividend flows from the income statement with sources and uses of funds derived from changes between balance sheet periods.

	A	E	F	G	H
1	<b>Statement of Cash Flows</b>				
2	<b>ShopNow!</b>				
3	<i>Indirect Method</i>				
4	<i>(\$millions)</i>				
5	For the Years Ended December 31,				
7		<u>2012</u>	<u>2013</u>		
8	<b>Cash flows from Operating Activities</b>				<b>Source</b>
9	Net Income	\$1,340	\$2,910		Income Statement
10	<i>Adjustments to Reconcile Net Income to Net Cash Flow</i>				
11	Noncash Adjustments				
12	+ Depreciation and Amortization	\$1,207	\$1,510		Income Statement
13	<i>Changes in Working Capital</i>				
14	Decrease (Increase) in A/R	(\$75)	(\$999)		-Δ Balance Sheet
15	Decrease (Increase) in Inventory	(700)	(1,476)		-Δ Balance Sheet
16	Decrease (Increase) in Other Current Assets	(1,401)	699		-Δ Balance Sheet
17	Increase (Decrease) in A/P	1,236	1,483		Δ Balance Sheet
18	Increase (Decrease) in Accrued Expenses	26	543		Δ Balance Sheet
19	Increase (Decrease) in Income Taxes and Other	1,040	(963)		Δ Balance Sheet
20	<b>Net Cash Flow From Operating Activities</b>	<b>\$2,673</b>	<b>\$3,707</b>		
22	<b>Cash flows from Investing Activities</b>				
23	CapEx Spend	(\$3,026)	(\$4,858)		-Δ Balance Sheet
24	<i>Changes in LT Assets &amp; Liabilities</i>				
25	Decrease (Increase) in Other Noncurrent Assets	(\$418)	(\$171)		-Δ Balance Sheet
26	Increase (Decrease) in Deferred Income Taxes and Other	691	416		Δ Balance Sheet
27	<b>Net Cash Flow from Investing Activities</b>	<b>(\$2,753)</b>	<b>(\$4,613)</b>		
29	<b>Cash flows from Financing Activities</b>				
30	Increase (Decrease) in Long-Term Debt [Source (Use) of Cash]	\$3,163	\$4,448		Δ Balance Sheet
31	Less Dividends Paid	(250)	(250)		Inputs
32	<b>Net Cash Flow from Financing Activities</b>	<b>\$2,913</b>	<b>\$4,198</b>		
34	<b>Summary</b>				PY Balance
35	Beginning Cash	\$682	\$3,515		Balance Sheet Cash
36	Ending Cash	<b>3,515</b>	<b>6,807</b>		
37	Minimum Cash Balance	250	250		Inputs
38	Excess (Required) Cash	<b>\$3,265</b>	<b>\$6,557</b>		

# Operating Activities

Activity	Description
Net Income	Bottom line of the income statement
Depreciation & Amortization	Depreciation and amortization expense from the income statement  This is an accounting rather than a cash transaction
Changes in Working Capital	An increase in assets or a decrease in liabilities marks a net cash outflow.  A decrease in assets or an increase in liabilities marks a positive cash flow.

# Investing & Financing Activities

## Investing Activities

These can include capital expenditures or proceeds from the sale of property, plant and equipment.

## Financing Activities

Related to debt and equity. When debt or equity accounts increase, the firm has received cash. If debt or equity accounts decrease, the firm must have used cash to reduce them.

# Assumptions for Financial Statement Projection

## Assumptions

Growth-rate percentages derived from the difference between the current and a previous year's value for a given line item.

OR

Ratios based on how one line item relates to another

	A	B	C	D	E	F	G	H	I
1							<i>Projected Financials</i>	2014	
2	<b>Financial Projection Input Assumptions</b>						Balance Sheet Check	OK	
3	(\$millions)						Cash Flow Check	OK	
4							Net Income Check	OK	
5		<b>Assumption:</b>	<b>Actual Performance</b>						
6	<b>Income Statement</b>	<b>2014</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>				
7	Revenue Growth Rate	30.0%	n/a	37.3%	21.6%				
8	Gross Profit (% of Revenue)	35.7%	35.6%	29.4%	35.7%				
9	SG&A (% of Revenue)	25.4%	21.7%	21.3%	24.4%				
10	Depreciation Rate (% of Gross PPE)	6.9%		6.4%	6.9%				
11	Long-Term Debt Interest Rate	5.2%		6.1%	5.2%				
12	Tax Rate (% of Income Before Tax)	30%	30.0%	30.0%	30.0%				
15	<b>Balance Sheet</b>	<b>2014</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>				
16	Average A/R Turnover Ratio	10.1		9.2	10.1				
17	Average Inventory Turnover Ratio	6.3		7.0	6.3				
18	Other Current Assets	\$1,468		\$2,167	\$1,468				
19	Gross PP&E Growth Rate (% of Revenue)	8.6%		6.5%	8.6%				
21	Other NonCurrent Assets	\$1,813		\$1,642	\$1,813				
22	Average A/P Turnover Ratio	5.8		6.8	5.8				
23	Current Portion of Long-Term Debt	\$606		\$1,016	\$606				
24	Average Accrued Expenses Turnover Ratio	29.5		30.3	29.5				
25	Taxes Payable and Other/Tax Expense	29.19%	29.17%	230.78%	29.19%				
26	Deferred Income Taxes and Other	\$2,412		\$1,996	\$2,412				
27	Additional Paid-In Capital	\$1,130		\$1,130	\$1,130				
28	Dividends/Share	\$0.25		\$0.25	\$0.25				
30	<b>Cash Flow Assumptions</b>								
32	Dividends Paid	(\$250)			(\$250)				
33	Minimum Cash Balance	\$250			\$250				

# Sensitivities, Scenarios and Simulations

## Sensitivity Analyses

Measure the effect on the entire forecast of changing a single assumption while leaving all other assumption values unchanged.

## Scenarios

Take the concept a step further by measuring the effects of changing multiple assumptions (or complementary effects of a key assumption) simultaneously, thus giving a more complete and realistic picture of probabilities and outcomes.

## Simulations

Computer models that allow all the uncertainties to change (be tested) at once. Simulations use assigned probability distributions for all selected variables and run multiple trials using semi-random values from each distribution.

# Sensitivity Analyses

Sensitivity Analyses can...	How...
Provide valuable insights...	<ul style="list-style-type: none"><li>• Identify the forecast's critical assumptions</li><li>• Define a range of possible outcomes</li><li>• Identify the "tipping point"</li></ul>
Be set up to determine how changes...	<ul style="list-style-type: none"><li>• In one variable affect the projection</li><li>• Affect key underlying metrics or drivers</li><li>• Answer the specific "what if" question</li></ul>

# Selecting Sensitivity Analyses Variables

- 1 What is the essential purpose of the forecast?
- 2 What are the key assumptions on which the projection is based?
- 3 Which variables are the most likely to change during the projection's time horizon?



## **Part 2**

# **Domain A: Analysis and Projections**

## **Chapter 3: Valuing Projects, Customers, Deals and Products**

# Valuing Projects, Customers, Deals, and Products

## *Topics Overview*

- *Capital Budgeting Process*
- *Discounted Cash Flow Method*
- *Analysis Methods*
- *Customer/Deal/Product Projections*

# Capital Budgeting Process

Strategic alignment of new investments

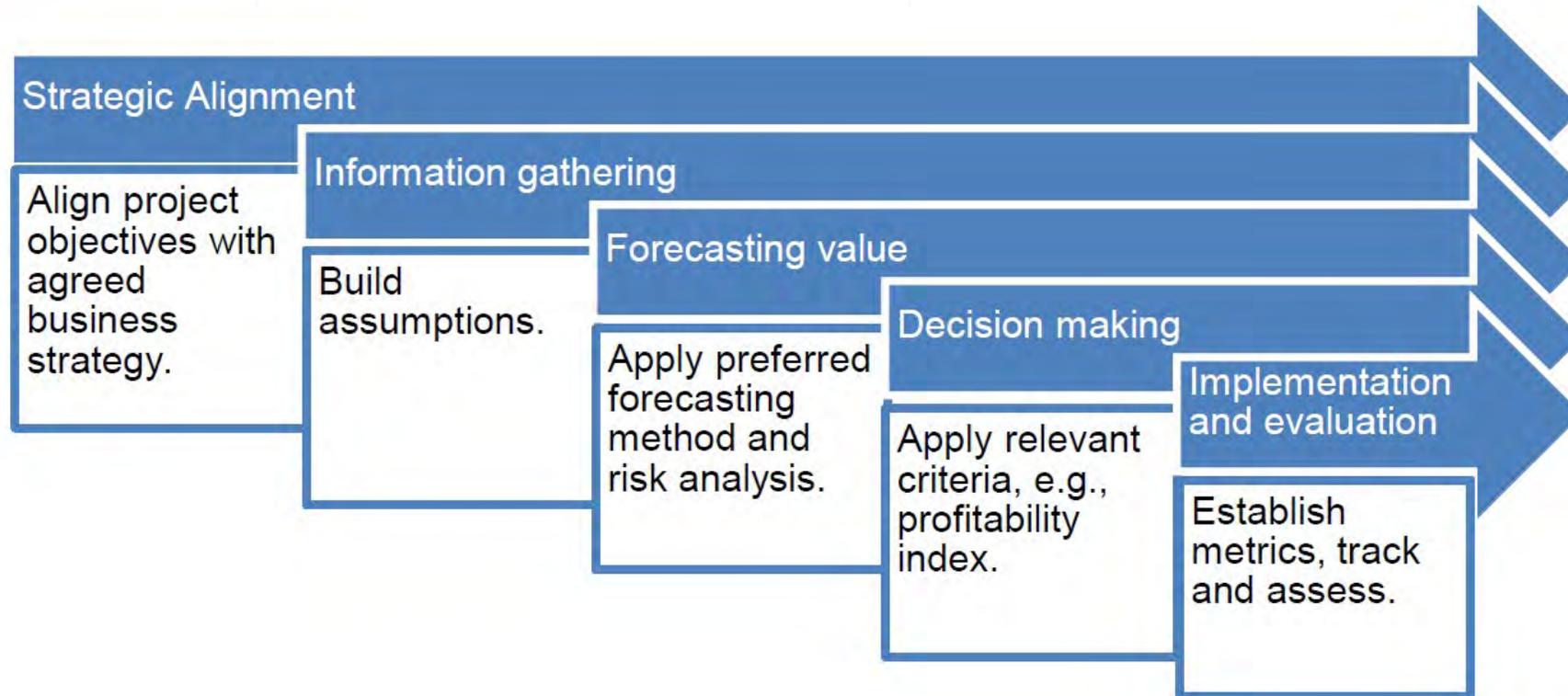
Marginal Benefits vs. Marginal Costs

Time Value of Money

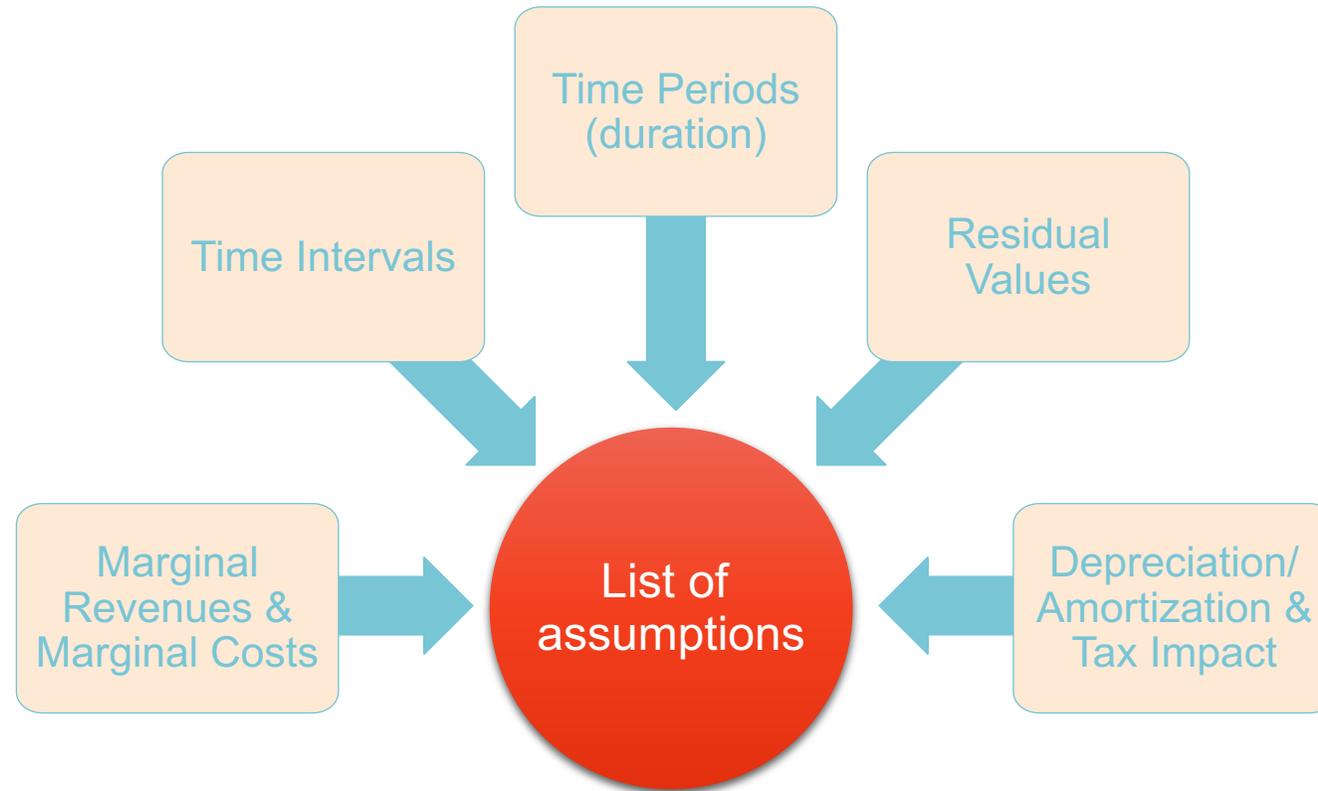
Role of FP&A in the capital budgeting process:

- Initial screen
- Evaluate and compare screened alternatives
- Prioritize

# Capital Budgeting Process



# Information Gathering



# Comparison of Analysis Methods

## Net present value (NPV)

- Identifies cash flow for each year of the project.
- Computes PV of cash flow for each period.
- Add present values of cash flows.
- An acceptable NPV is greater than Zero.

## Internal rate of return (IRR)

- Uses discounted cash flow.
- Discount rate at which the present value of all cash inflows equals the present value of all cash outflows.
- Acceptable only if the IRR exceeds target rate of return or WACC.

# Comparison of Analysis Methods

## Payback and Discounted Payback

- Determines the time required for an organization to recover its original investment through future cash flows.
- The longer the period required to recoup the original investment the less certain the projected cash flows are.
- The payback method is a good screening tool .
- Does not consider what happens to cash flows after the break-even point.

## Profitability Index

- Ratio of a project's returns to the project's required investment.
- If the ratio is greater than 1, the project is viable.

# Payback Period

The number of periods required for the sum of the expected cash inflows to equal the initial outlay

- Time needed to recover initial investment

Decision rule: Compare it to a standard value

- A longer Payback Period implies more risk

Example: An investment has an upfront cost of \$75,000 and will generate an \$18,000 5-year annuity beginning one year from now.

# Payback Period Example

Year	Cash Inflow	Cumulative Cash Inflow	Unrecovered Investment at Year End
0	0		\$75,000
1	\$18,000	\$18,000	\$57,000
2	\$18,000	\$36,000	\$39,000
3	\$18,000	\$54,000	\$21,000
4	\$18,000	\$72,000	\$3,000
5	\$18,000	\$90,000	—

$$\text{Payback Period} = 4 \text{ Years} + \left( \frac{\$3,000}{\$18,000} \right) = 4.17 \text{ Years}$$

# Weaknesses of Payback Period

## Ignores

- The timing and riskiness of future cash flows (i.e., time value of money)
- Cash inflows that occur after Payback
  - This causes bias against investments with longer durations

## So why bother with the Payback Period?

- Simple and efficient screening tool
- A measures of project liquidity

# Discounted Payback Period

**Similar to the Payback Period but the future cash flows are discounted**

- Implications: Discounted Payback Period method accounts for timing and riskiness of cash flows, unlike the Payback Period
- The Discounted Payback Period > Payback Period

**Both measures ignore expected cash flows that occur after payback**

# Discounted Payback Period Example

Year	Cash Inflow	Present Value of Cash Inflow (10%)	Cumulative Discounted Cash Inflow	Unrecovered Investment at Year End
0	0			\$75,000
1	\$18,000	\$16,363.63	\$16,363.63	\$58,636.36
2	\$18,000	\$14,876.03	\$31,239.66	\$43,760.33
3	\$18,000	\$13,523.67	\$44,763.33	\$30,236.66
4	\$18,000	\$12,294.24	\$57,057.57	\$17,942.42
5	\$18,000	\$11,176.58	\$68,234.15	<b>\$6,765.84</b>

# Profitability Index (PI)

The PI shows the present value of cash flows as a ratio of the upfront cost

$$PI = \frac{\frac{CF_1}{(1+WACC)^1} + \frac{CF_2}{(1+WACC)^2} + \dots + \frac{CF_N}{(1+WACC)^N}}{\text{Upfront Costs}}$$

**Decision Rule: Accept if PI > 1.0**

# Profitability Index Example

**Discount Rate = 10%**

Time	Cash Flow
0	(\$75,000)
1	\$18,000
2	\$18,000
3	\$18,000
4	\$18,000
5	\$18,000

# Profitability Index Example

$$\text{PV of Cash Inflows} = \frac{\$18,000}{1.10^1} + \frac{\$18,000}{1.10^2} + \frac{\$18,000}{1.10^3} + \frac{\$18,000}{1.10^4} + \frac{\$18,000}{1.10^5}$$

$$\text{PV of Cash Inflows} = \$68,234.16$$

$$\text{PI} = \$68,234.16 / \$75,000 = 0.9098, \text{ so reject}$$

# More on Profitability Index

The PI has many of the same features as the NPV

- If  $NPV > \$0$ , then  $PI > 1.0$  and vice versa

Unique benefit of the PI?

- Communicating the project's value
- A PI of 1.20 would indicate that the project produces \$1.20 of present value CF for each \$1 invested

# Customer & Product Historical Data

## Existing Customer

- Pulling data
- Analyze for trends & issues
- Analyze for supply and demand
- Customer demographics
- Profit & Loss by product category

## New Customer

- Use proxies or assumptions
- Similar customer segment or similar product at the organization

# Relationship Between Cost & Value

Marginal Cost

vs.

Marginal Value



# Analyzing Customer Value

*Pareto Principle: ~20% of customers generate ~80% of profits*

Customer Revenue Analysis

Customer Cost Analysis

Customer Lifetime Value

- No set approach but compared to NPV method

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## **Part 2**

# **Domain A: Analysis and Projections**

## **Chapter 4: Risk Analysis**

# Risk Analysis

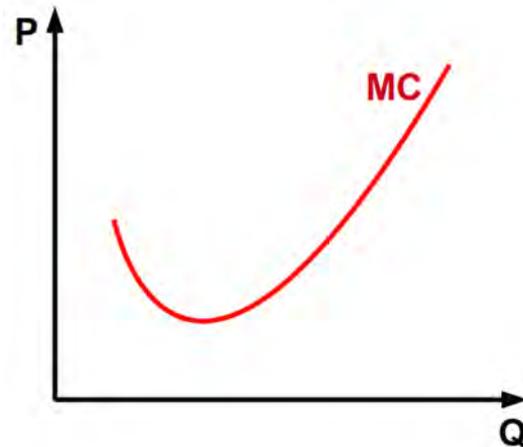
## *Topics Overview*

- *Risk-Adjusted Cost of Capital*
- *Real Options*
- *Value at Risk (VaR)*
- *Sensitivity/Scenario/Simulation Applied to Risk*

# Weighted Average Cost of Capital & Hurdle Rates

## WACC

The marginal cost that an organization would incur to raise new funds.



## Hurdle Rates

A minimum rate of return below which projects are rejected as not being profitable enough for the given amount of risk

# WACC

The capital budgeting metrics account for the opportunity cost of future cash inflows using the weighted average cost of capital (WACC)

$$WACC = [W_D * (Cost\ of\ Debt * (1 - t))] + [W_E * Cost\ of\ Equity]$$

The yield to maturity (YTM) on the firm's most recent bond issue is usually the best proxy for the cost of debt

The cost of equity is frequently calculated using the CAPM

# WACC Example

From the Balance Sheet: Assets = \$2,000,000 and Equity is \$700,000

YTM on bonds = 7%

Cost of equity = 12%

Tax rate = 35%

What is the firm's WACC?

# Answer

$$W_D = \$1,300,000 / \$2,000,000 = 65\%$$

$$W_E = \$700,000 / \$2,000,000 = 35\%$$

$$WACC = (0.65 * 0.07 * (1 - 0.35)) + (0.35 * 0.12) = 7.16\%$$

# CAPM

## CAPM

A way to describe the relationship between risk and the required rate of return on an asset.

- Stocks riskier than the market have a beta of more than one.
- Stocks that are more stable than the market have a beta of less than one.

### Example:

A beta of 0.4 indicates that the stock price rises and falls only 40 percent as fast as the market and is therefore less risky.

# CAPM

Cost of Equity = Risk-Free Rate of Return +  
Beta \* (Expected Market Return – Risk-Free Rate of Return)

The critical variable is Beta (estimated via regression analysis)

Key values for Beta include:

- Beta = 1.00
- Beta > 1.00
- Beta < 1.00

Use the T-Bill or T-Bond yield for the Risk-Free Rate

Use a broad market index for the Expected Market Return

# CAPM Example

Use the CAPM to estimate the cost of equity assuming a Beta of 1.5

Assumptions:

Risk-free rate = 2%

S&P 500 = 8%

# CAPM Examples

$$k_e = 0.02 + 1.5(0.08 - 0.02) = 0.11 \text{ or } 11\%$$

This table shows how the  $k_e$  varies with Beta

Beta	$k_e$
1.5	11%
1.2	9.2%
1.0	8%
0.5	5%
0.0	2%

# Estimating Beta

## Pure Play

- A publicly traded organization that is solely devoted to what the business unit or project intends to do – a single business focus.
- Use an average of the betas to get the best results.

## Accounting Betas

- Used when no pure plays can be found.
- Can only be estimated for a business unit not a project.
- Found by using regression analysis, comparing the unit's accounting return on assets against its average return on assets.

# Types of Risks

- 1 Stand-alone risk
- 2 Portfolio risk
- 3 Beta risk



Risk

# Risk Adjustments

**By specifying a range of possible values for an investment's cash flows, and the associated probabilities, the user can better assess expected return and risk**

# Probability – Adjusted NPV

	A	B	C	D	E
1			<b>Probability</b>		<b>After-Tax Annual Cash Flows</b>
2	<b>Worst Case</b>		0.3		(\$20)
3	<b>Base Case</b>		0.5		\$80
4	<b>Best Case</b>		0.2		\$140
5	<b>Expected After-Tax Annual Cash Flows</b>				<b>\$62</b>
6					
7	<b>Risk-Adjusted Cost of Capital</b>			15%	
8	<b>Year 0 Investment</b>			(\$200)	
9	<b>Number of Periods</b>			5	
10	<b>NPV</b>				<b>\$7.83</b>

Implement or Delay?

# Probability-Adjusted NPV

The setup: An investment will produce a 5-year annuity cash flow stream of either -\$20M, \$80M, or \$140M. Since the upfront cost and discount rate are assumed to be known, the question becomes, what is the expected value/probability adjusted cash flow stream?

Expected value/probability adjusted cash flow stream=

$$(0.30 * -\$20) + (0.5 * 80) + (0.2 * 140) = \$62M$$

# Probability-Adjusted NPV

Assuming a WACC of 15%, we're ready for the NPV calculation:

$$NPV = -\$200M + \frac{\$62M}{(1.15)^1} + \dots + \frac{\$62M}{(1.15)^5}$$

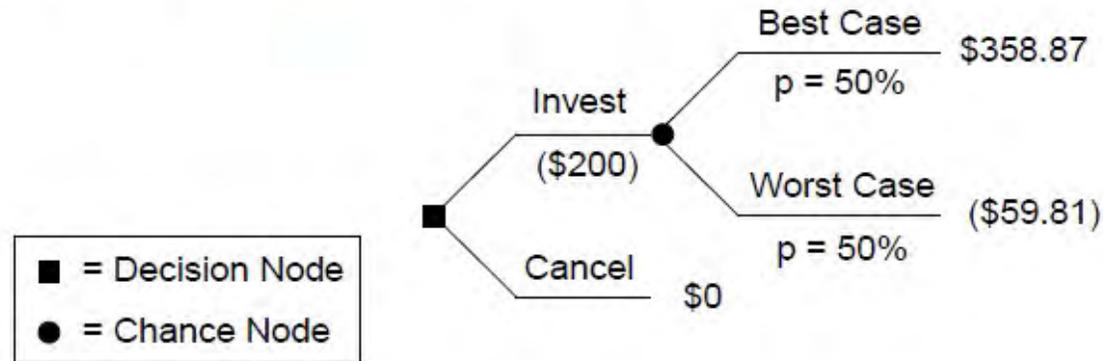
$$NPV = \$7.83M$$

# Flexible Options

OPTION A	OPTION B
Invest	Not invest
Continue	Abandon
Expand	Not expand
Contract	Not contract
Continue	Delay

# Decision Trees

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<b>Real Options Analysis</b>													
2	<b>Option to Invest or Cancel Only</b>													
3	All amounts in US\$ millions													
4	<b>Period</b>				<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>PV</b>	<b>NPV</b>		
5	Worst Case				(\$200)	(\$20)	(\$20)	(\$20)	(\$20)	(\$20)	(\$59.81)	(\$259.81)		
6	Best Case				(\$200)	\$120	\$120	\$120	\$120	\$120	\$358.87	\$158.87		
7	Expected Case				(\$200)	\$50	\$50	\$50	\$50	\$50	\$149.53	(\$50.47)		



Best case \$358.87 = L6 in PV column on worksheet

Worst Case (\$59.81) = L5 in PV column on worksheet

# The Option to Continue or Abandon

Building on the previous example, suppose that if the Worst Case scenario is apparent at the end of Year 1, we can abandon the investment and sell PPE for a net cash flow of \$50M at the end of year 2.

Now, the Worst Case CF stream would be -\$20M, \$50M, \$0, \$0, \$0 and the Best Case remains unchanged

# The Option to Continue or Abandon

$$NPV \text{ Worst Case} = -\$200M + \frac{-\$20M}{1.2^1} + \frac{\$50M}{1.2^2} = -\$181.94$$

$$NPV \text{ Best Case} = \$158.87$$

$$NPV \text{ Expected Case} = (0.5 * -\$181.94) + (0.5 * \$158.87) = -\$11.54M$$

$$\text{Value of the Abandonment Option} = \text{New NPV} - \text{Old NPV} = -\$11.54 - (-\$50.47) = \$38.93$$

# Value at Risk (VAR)

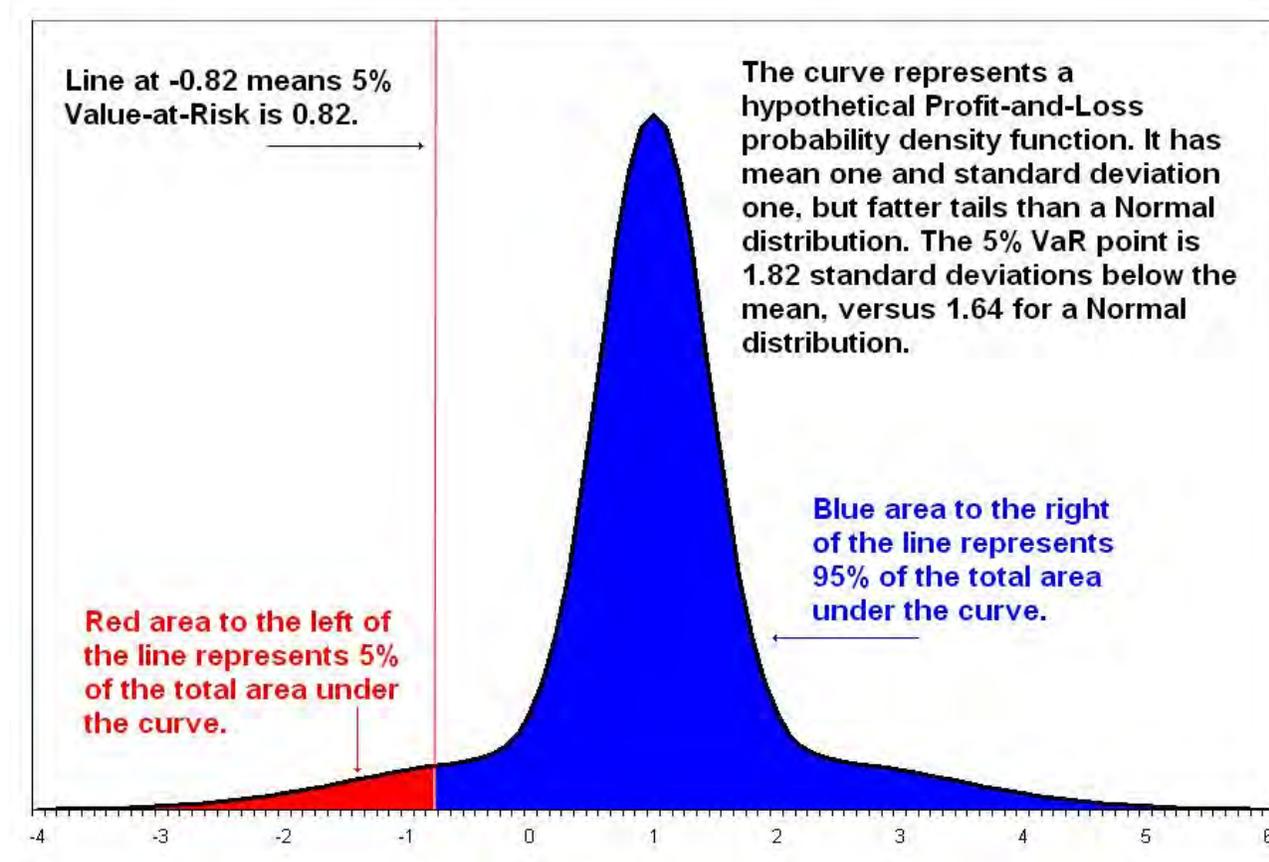
**Maximum loss on a portfolio of assets (stocks, bonds, FX, etc.) that can occur over a given time period based upon a given confidence level**

- VAR can be framed as a maximum loss or as a minimum loss

**VAR essentially provides the user with the lower endpoint of a confidence interval**

- Most accurate when the underlying variable is normally distributed
- Often referred to as *variance-covariance method*

# Graphical Depiction of VAR: Online Source



# VAR Equation

$$VAR = (Mean Return - Z Score Value * Standard Deviation) * Portfolio Value$$

It is essentially one side of a confidence interval (which is then multiplied by the Portfolio Value)

# More on VAR

Since the VAR methodology incorporates a confidence interval, the user must choose the confidence level

- Common choices include 95% and 99% confidence levels
- The former leads to a confidence interval that would cover 95% of sample mean values
- In practice, a higher confidence level provides more certainty

The 95% confidence level associates with a Z-Score value of 1.65

The 99% confidence level associates with a Z-Score value of 2.33

# VAR Calculations

Suppose we have an equity portfolio value of \$50M. Historically, the daily return earned on the portfolio is 0.05% with a daily standard deviation of 1%.

$$\text{VAR at 95\%} = \$50,000,000 * (0.0005 - 1.65 * 0.01) = -\$800,000$$

$$\text{VAR at 99\%} = \$50,000,000 * (0.0005 - 2.33 * 0.01) = -\$1,140,000$$

*The maximum loss increases with the confidence level*

# Multi-Day VAR Calculation

What if the user wants a 10-day VAR?

*Multiply the given VAR by  $\sqrt{10}$*

$$10\text{- day VAR at 95\%} = -\$800,000 * \sqrt{10} = -\$2,529,822$$

# Other Ways to Estimate VAR

Historical Simulation

Monte Carlo Simulation

## **Part 2**

# **Domain A: Analysis and Projections**

## **Chapter 5: Analyzing Information and Giving Feedback**

# Analyzing Information and Giving Feedback

## *Topics Overview*

- *Perform Variance Analysis and Reporting*
- *Perform Competitive Analysis*
- *Provide Feedback and Revise Documentation*

# Purpose & Use of Variance Analysis

1

Recorded as absolute values & labeled favorable (F) or unfavorable (U).

2

Performing the raw subtraction and retaining the positive & negative values.

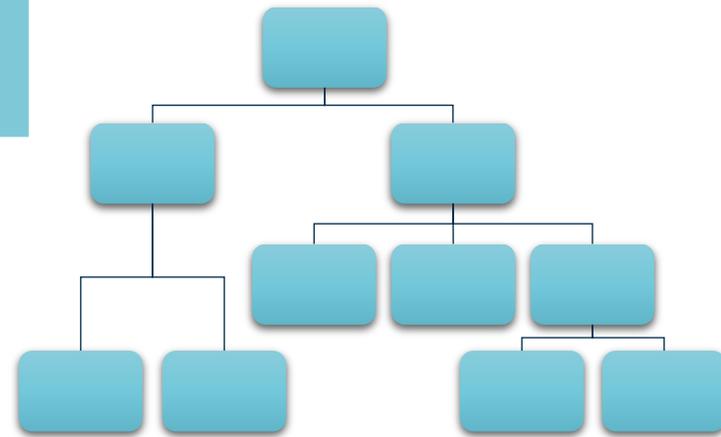
3

Help/hurt framework – favorable variances are always shown positive and unfavorable variances are always shown negative.

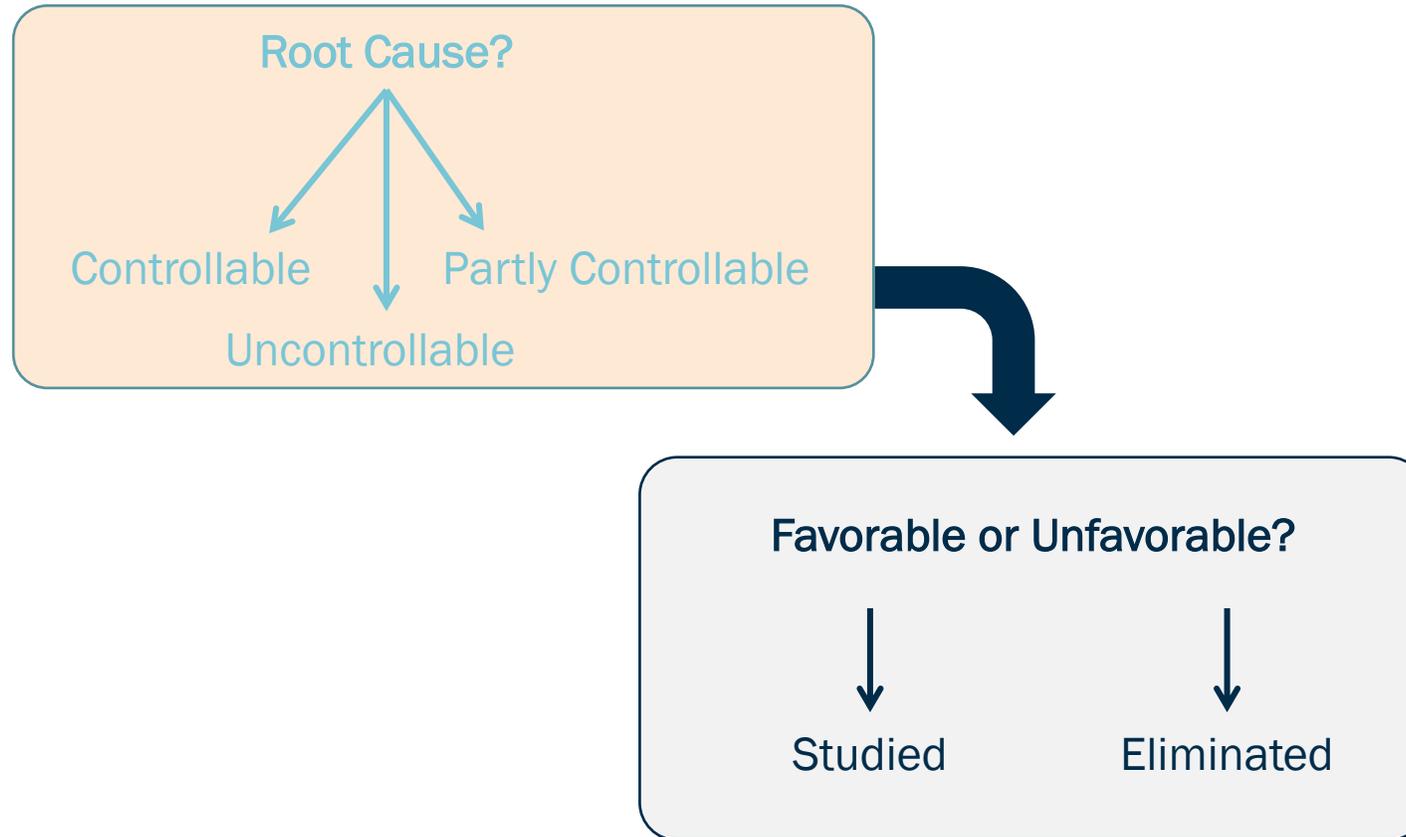
# Root Causes & Interrelationships

Variations are split into subcomponents:

- Interrelationships can be understood
- Problems can be tracked and fixed without creating other unintended consequences
- Successes can be replicated



# Management by Exception



# Variance in Static & Flexible Budgets

## Static Budget

Is a master budget that is fixed at a level of sales in units that was determined when the budget was finalized.

Most master budgets are static.

## Flexible Budget

Is a master budget that uses the actual sales in units to determine other budgeted revenues and costs as if the sales target in units had been exactly correct.

Flexible budgets cannot be calculated until actual sales units are known.

Used to allow variance analysis to compare apples to apples.

# Calculating Variances in Budgets

$$\text{Static-Budget Variances} = \text{Actual Results} - \text{Static Budget}$$

$$\text{Flexible-Budget Variances} = \text{Actual Results} - \text{Flexible Budget}$$

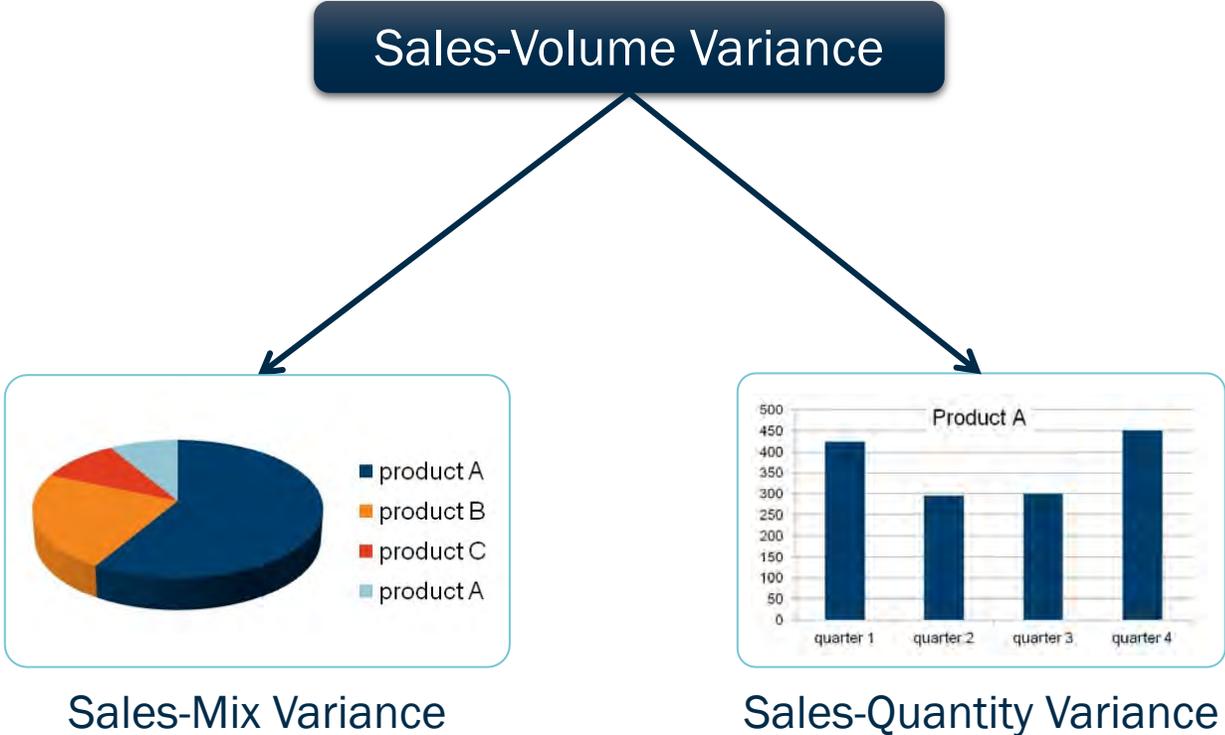
# Splitting Variances into Components

	A	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	<b>Panama Mine Division</b>	<b>Flexible-Budget Variances (Actual – Flexible)</b>					<b>Sales-Volume Variances (Flexible – Static)</b>					<b>Static-Budget Variances (Actual – Static)</b>							
2	2014 Budget	<b>Copper</b>		<b>Gold</b>		<b>Total</b>		<b>Copper</b>		<b>Gold</b>		<b>Total</b>		<b>Copper</b>		<b>Gold</b>		<b>Total</b>	
3	Units Sold in MTs	\$0.0		\$0.0		\$0.0		2,250 F		1.2 F		2,251.2 F		2,250 F		1.2 F		2,251.2 F	
4	Price/Unit	\$270 U		\$800,000 U				\$0		\$0				\$270 U		\$800,000 U			
5	Revenues (US\$Millions)	\$6.7 U		\$1.8 U		\$8.4 U		\$18.9 F		\$62.4 F		\$81.3 F		\$12.2 F		\$60.6 F		\$72.8 F	
6	Variable Costs																		
7	Direct Labor	\$0.8 F		\$1.2 U		\$0.4 U		\$2.3 U		\$3.7 U		\$6.0 U		\$1.5 U		\$4.9 U		\$6.4 U	
8	Variable overhead	\$2.6 F		\$1.1 U		\$1.5 F		\$1.5 U		\$5.6 U		\$7.1 U		\$1.1 F		\$6.7 U		\$5.6 U	
9	Total Variable Cost:	\$3.4 F		\$2.2 U		\$1.1 F		\$3.8 U		\$9.4 U		\$13.1 U		\$0.4 U		\$11.6 U		\$12.0 U	
10	Contribution Margin	\$3.3 U		\$4.0 U		\$7.3 U		\$15.1 F		\$53.0 F		\$68.1 F		\$11.8 F		\$49.0 F		\$60.8 F	
11	Fixed Overhead					\$6.4 U						\$0.0						\$6.4 U	
12	Operating Income					\$13.7 U						\$68.1 F						\$54.4 F	

# Potential Root Causes

Potential Cause	Control	Responsible Party
<b>Sales-mix variance:</b> Products or divisions sell in a different mix than budgeted (addressed in detail later).	Partly controllable	Marketing/sales manager
<b>Planning variance:</b> Economic or industry-wide conditions are worse than budget assumptions.	Uncontrollable	None, but FP&A may verify whether assumptions could have been improved.
<b>Competitor actions:</b> For example, competitors lower prices and the organization did not also lower prices.	Partly controllable	Marketing/sales manager
<b>Adaptation to demand patterns:</b> Slow to adapt to customer preferences.	Controllable	Marketing manager
<b>Poor quality:</b> Inferior goods sell poorly.	Controllable	Production/procurement manager
<b>Poor/insufficient marketing:</b> Customers not properly motivated.	Controllable	Marketing manager
<b>Poor/erroneous quantitative forecast or budget:</b> Forecast error exists.	Fully or partly controllable	FP&A
<b>Bias in expert judgment:</b> Sales or marketing bias goes unchallenged.	Fully or partly controllable	FP&A and marketing/sales manager

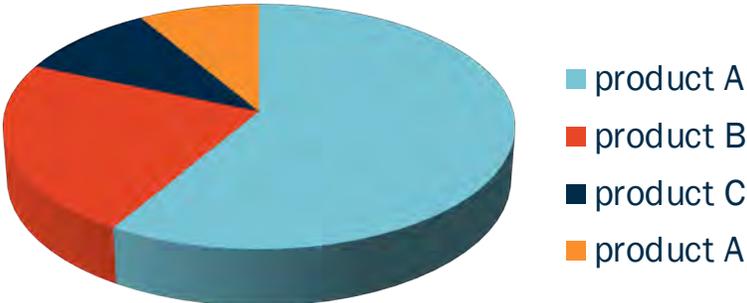
# Splitting Sales-Volume Variance



# Sales Mix Variance

## Sales-Mix Variance

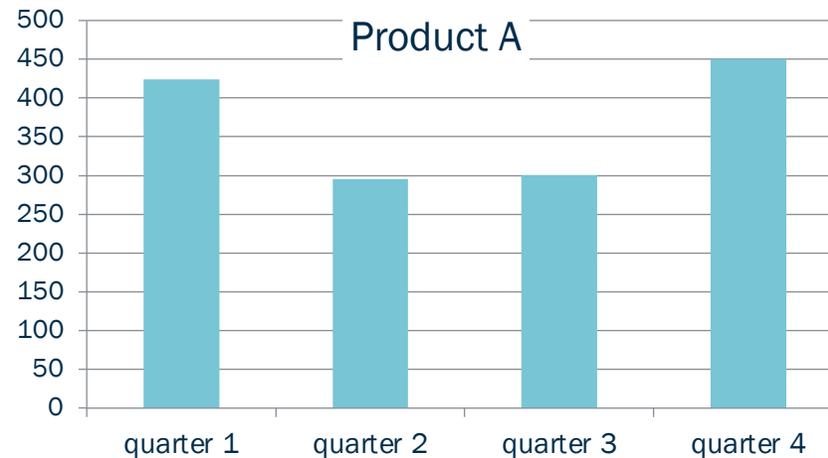
$$\begin{aligned} &= \text{Actual Units Sold (All Products)} \\ &\times (\text{Actual Sales Mix \%} - \text{Budgeted Sales Mix\%}) \\ &\times \text{Budgeted Contribution Margin/Unit} \end{aligned}$$



# Sales-Quantity Variance

## Sales-Quantity Variance (for one item in mix)

$$\begin{aligned} &= (\text{Actual Sales Volume for All Units} \\ &- \text{Budgeted Sales Volume for All Units}) \\ &\times \text{Budgeted Sales Mix \%} \\ &\times \text{Budgeted Contribution Margin/Unit} \end{aligned}$$



# Flexible-Budget Sales/Revenue Variance

## Selling Price

$$\text{Selling-Price Variance} = \left( \begin{array}{c} \text{Actual} \\ \text{Selling} \\ \text{Price} \end{array} - \begin{array}{c} \text{Budgeted} \\ \text{Selling} \\ \text{Price} \end{array} \right) \times \text{Actual} \\ \text{Units Sold}$$

# Discussion Question

Match the standards to the definition.



Answer:

- |                         |  |
|-------------------------|--|
| <b>C</b> Standard Input | <b>A</b> Price the organization expects to pay for one input unit                                    |
| <b>A</b> Standard Price | <b>B</b> Is the benchmark cost of an output unit of a product/service or of a component of this cost |
| <b>B</b> Standard Cost  | <b>C</b> The benchmark input quantity required to produce one output unit.                           |

# Direct Materials & Direct Labor

## Flexible-Budget Variances

$$\text{Price Variance} = (\text{Actual Price of Input} - \text{Budgeted Price of Input}) \times \text{Actual Quantity of Input}$$

Shows how much impact the difference in the average cost of labor per hour or the price of individual material.

$$\text{Efficiency Variance} = (\text{Actual Price of Input} - \text{Flexible-Budgeted Quantity of Input}) \times \text{Budgeted Price of Input}$$

Reflects whether total resource input quantities (raw materials or labor hours in total) are used efficiently (favorable) or inefficiently (unfavorable) relative to the total budget input quantities.

# Variable Overhead

## Efficiency & Spending Variance

$$\begin{aligned} \text{VOH Spending Variance} = & \\ & (\text{Actual VOH/Cost-Driver Unit} - \\ & \text{Budgeted VOH/Cost-Driver Unit}) \\ & \times \text{Actual Cost-Driver Quantity} \end{aligned}$$

Indicate that the amount spent on variable overhead items was less than expected.

$$\begin{aligned} \text{VOH Efficiency Variance} = & \\ & (\text{Actual VOH Cost-Driver} \\ & \text{Quantity} - \text{Flexible-Budgeted} \\ & \text{VOH Cost-Driver Quantity}) \times \\ & \text{Budgeted VOH/Unit of} \\ & \text{Cost Driver} \end{aligned}$$

Favorable means that fewer cost driver units were needed to produce the products/services than expected.

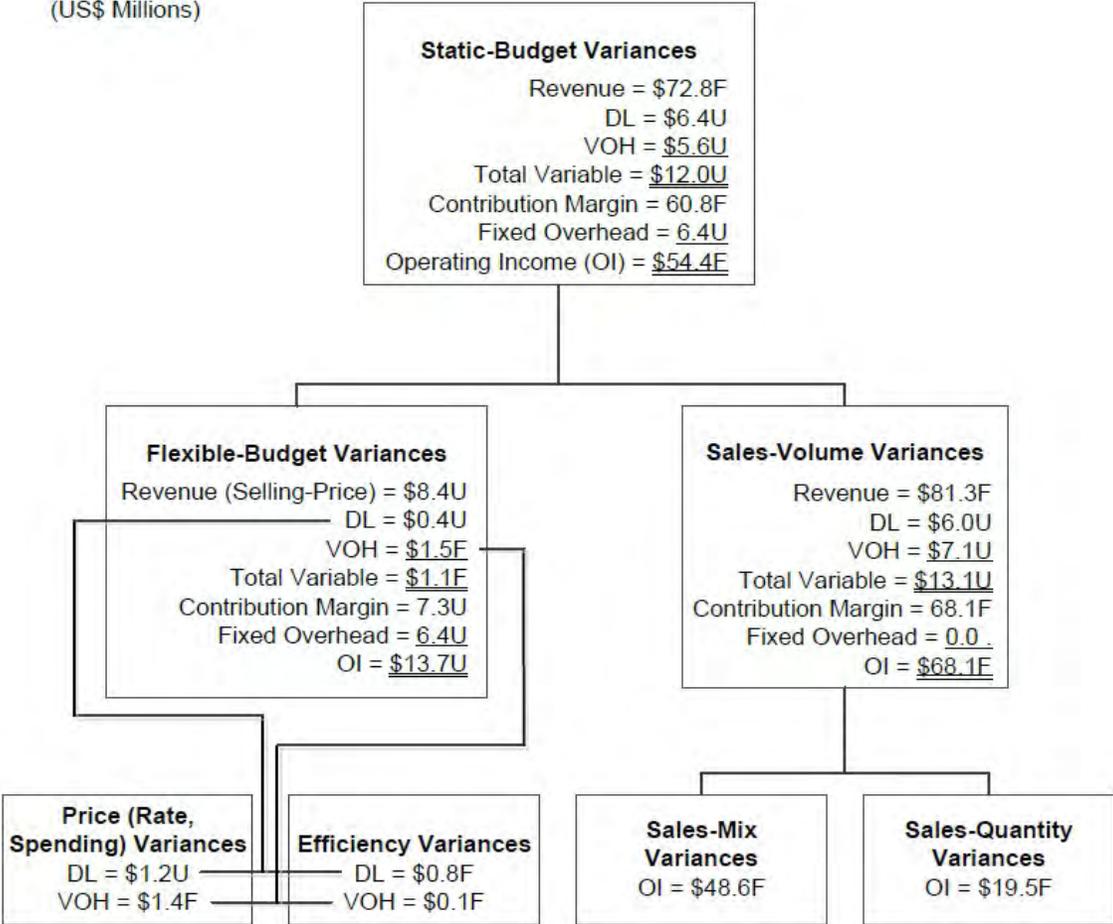
# Variance Reporting



- Reporting summary information
- Highlight different exceptions for special review
- Exceptions should be material and controllable

# Summary of Variances

(US\$ Millions)



# Competitive Analysis

## Definition

The Comparison of an organization's market position, actions and strategic plans to those of its competitors.



# Competitive Analysis Skills

Judgment



Interpretation



# Discussion Question

Match the relative measurements to the appropriate definition.



Answer:

**B** Measurement Variance

**A** Trend Comparison

**C** Metric Interrelationship

**A** Shows if gaps are increasing or decreasing and the projected rate of change

**B** How much higher or lower the key metric is in absolute value at that point

**C** Study of multiple metrics to determine what trade-offs each organization is making to improve certain metrics and ratios

# Process of Gathering Information

## Publicly Available Information

Financial Statements

Annual Reports

Press Releases

Marketing Information

## Not Public Information

Financial Ratios

Research Firm

Annual Reports

Calling Competitor's Sales Force,  
Suppliers, Distributors or  
Subcontractors

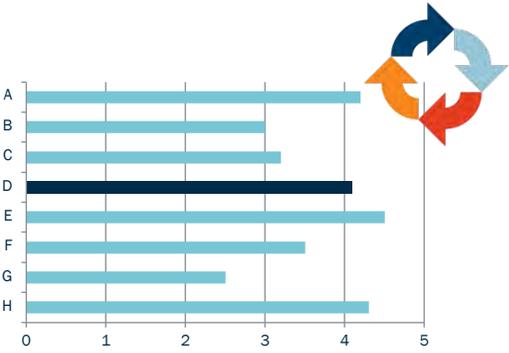
# Competitive Analysis Responsibilities

## FPA Professional

- Isolate the competitive analysis to as few variables as possible
- Having the correct information on the organization itself
- Get data in a useful and comparable format for analysis



# Types of Competitive Analysis



Benchmarking

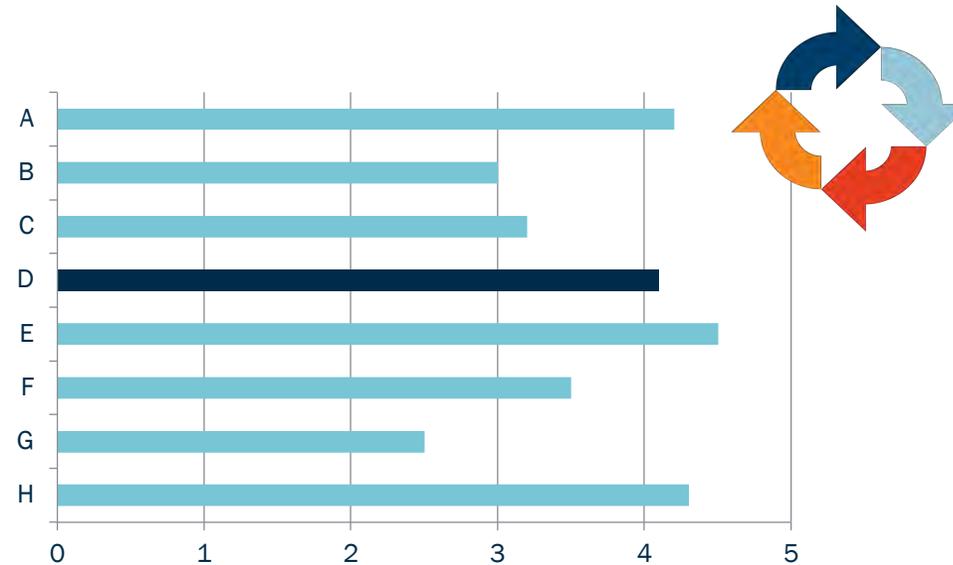


Peer Group Analysis



Ratio Analysis

# Benchmarking



## Key to Success

Systematic and continuous measurement against a point of reference to provide ongoing feedback

# Ratio Analysis



## Making it more reliable

- Smooth out fluctuations or temporary account shifts by taking an average of an organization's ratios over several periods.
- Exclude extraordinary or other unlikely-to-occur event and other outliers
- Study trends in ratios over time and their rate of change after adjusting for seasonality or other cyclical factors
- Use statistically validated analysis models to create composite ratios that have specific weightings for each ratio in the model
- Create common-size financial statements to help interpret underlying changes in ratio trends

# Tools for Competitive Analysis

## Trend Analysis

Examines how a KPI or ratio changes over time. Trends are examined relative to the same trends for reference organizations or industry averages to show how they are diverging or remaining steady over time.

## Common-size Analysis

Expresses all values as a percentage of a total value to remove the confusing effect of organizational size when making comparisons

## Percentage-change Analysis

Calculates the percentage change from period to period for financial statement elements or other comparative data.

# Lessons Learned



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Part 2

Domain A: Analysis and Projections

Chapter 5: Analyzing Information and

Giving Feedback

## **Part 2**

### **Domain B: Models and Analytics**

#### **Chapter 6: Specifying Outputs and Getting Inputs**

# Specifying Outputs and Getting Inputs

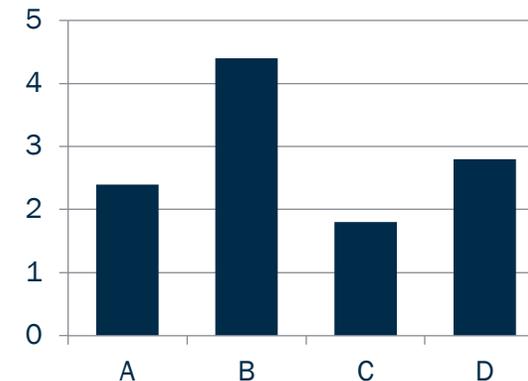
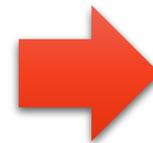
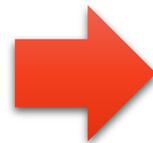
## *Topics Overview*

- *Understand the End Product and Define the Outputs*
- *Define Key Inputs and Input-to-Output Logic*
- *Gather Data and Assumptions and Identify Gaps*
- *Seek Missing Information and/or Use Proxies and Assumptions*
- *Sources of Industry Information*

# Financial Model

A financial model is a tool that takes inputs, makes calculations and produces outputs that change flexibly and dynamically in response to changes in inputs.

A	2.4
B	4.4
C	1.8
D	2.8



# Why Model Building Is Important to the FP&A Profession

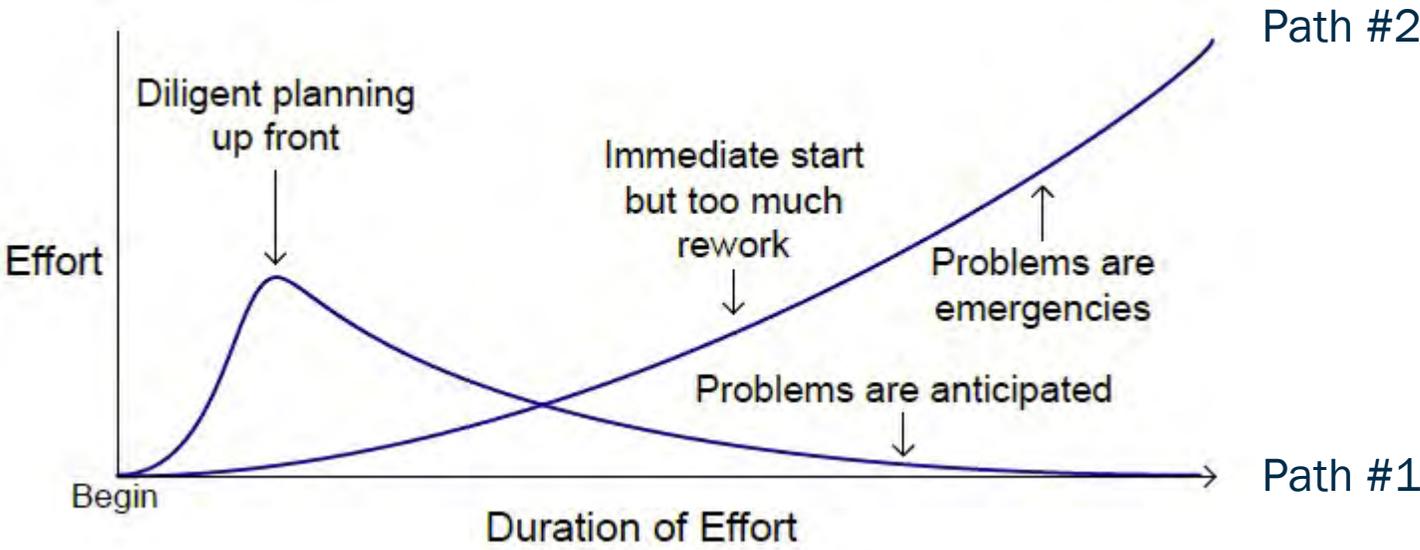
Efficient

Accurate

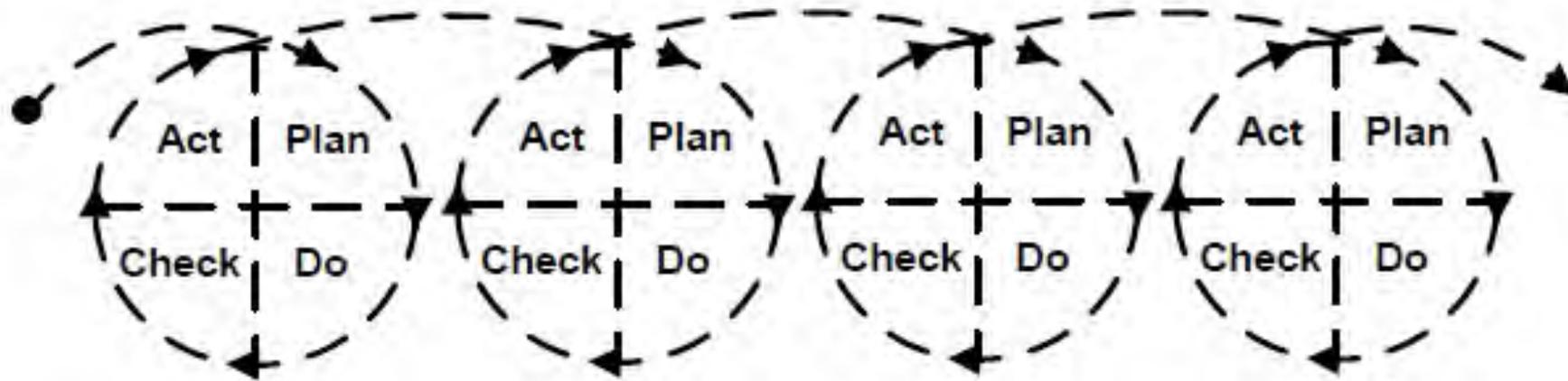
Useful



# How Diligent Planning Can Reduce Total Effort



# Iteration Is the Key



# Stakeholders

*Who are they?*



# Mining Company Case Study

## Mine A

Expected remaining life: 10 years

- Copper reserves: 254,000 metric tons (MT, or 1,000 Kg)
- Annual extraction: 25,000 MT

## Mine B

Expected remaining life: 12 years

- Copper reserves: 278,000 MT
- Annual extraction: 23,000 MT

## Mine C

Expected remaining life: 14 years

- Copper reserves: 337,000 MT
- Annual extraction: 24,000 MT



# Mining Company Case Study

## Problem, Goals & Uncertainties

- Need to buy or lease new mines before existing ones are depleted
- Potential to buy copper mine in Panama
- Price is promising, but reserves uncertain

## End Product

- Invest?
- Maximum price?

## Outputs

- NPV
- IRR
- Profitability index
- Payback period
- Discounted payback period
- Expected life of mine



# Defining Key Inputs

## Direct Inputs

- Variables
- Constants
- Semi-variables

## Contextual Inputs

## Derived Inputs



# Specify Value Drivers and Related KPIs

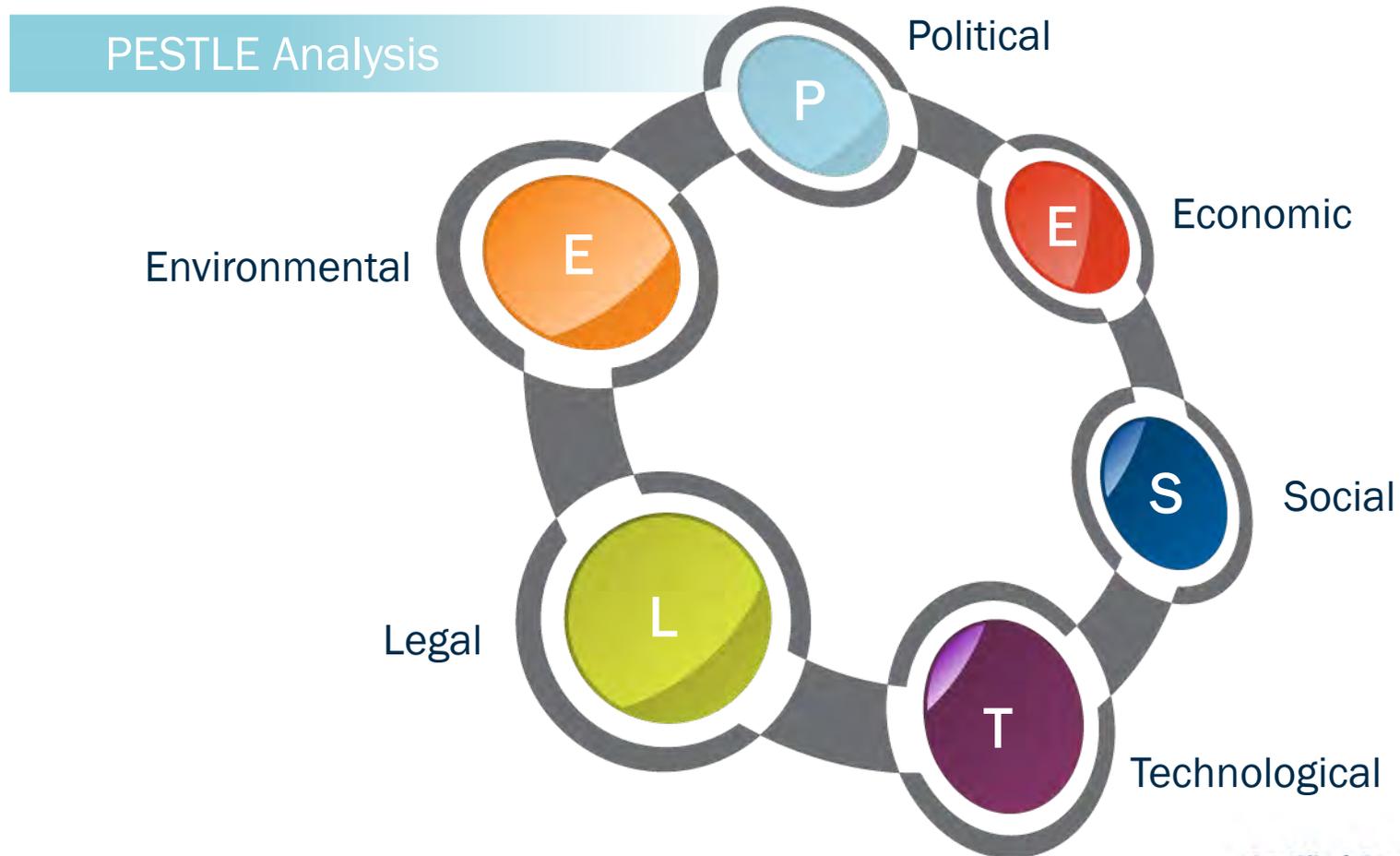
## Value Drivers

Also called business drivers, are factors that affect the organization's ability to generate economic value.

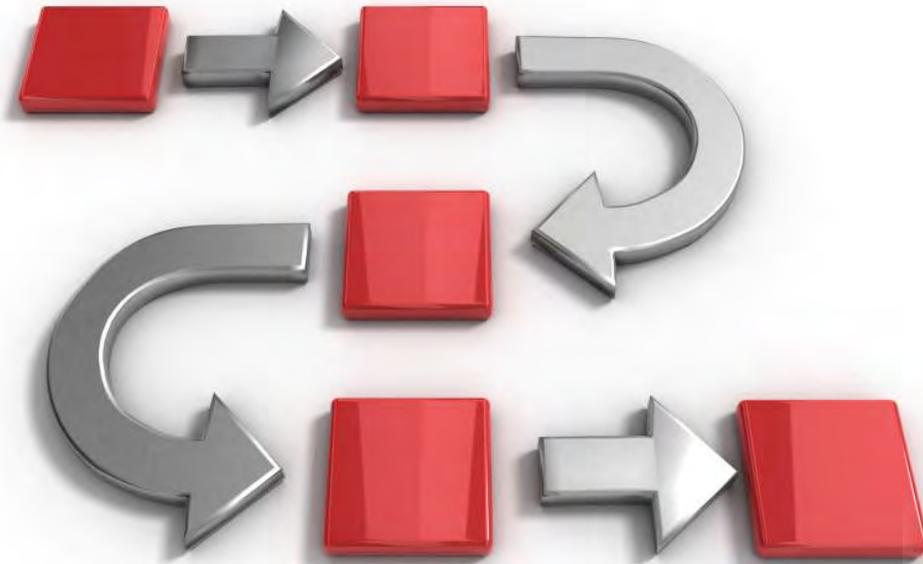
## Key Performance Indicator (KPI)

A metric that indicates the level of performance required to achieve a defined objective in a certain activity.

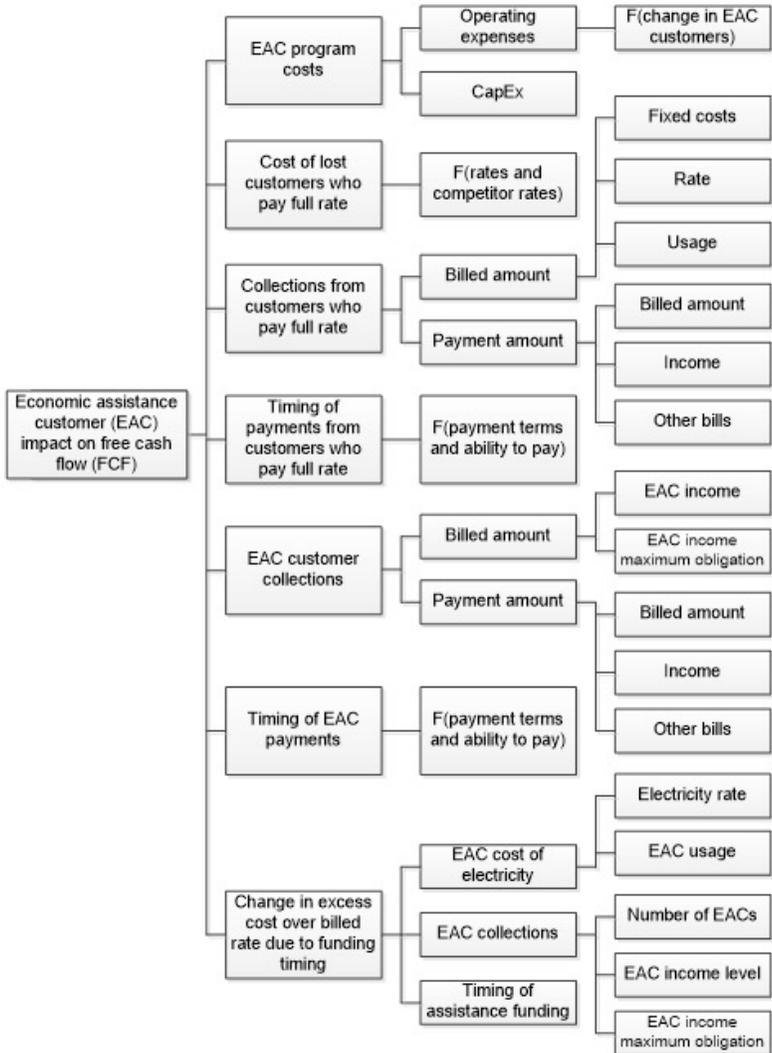
# External Value Drivers and Related KPIs



# Document the Logical Flow of Inputs to Outputs



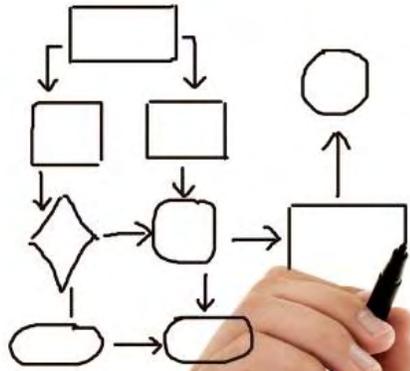
# High-Level Logic Flowcharts



# Detail-Level Process Flows

	A	B	C	D	E
1	<b>Total Population</b>				
2	×				= Direct Input
3	<b>% Families with Newborns</b>				
4	=				= Derived Input
5	<b>New Parents (Target Market)</b>				
6	×				= Output
7	<b>% Take-up Rate</b>				
8	=				
9	<b>New Customers (Goal)</b>	×	<b>Average Purchases per Period</b>	=	<b>New Customer Revenue</b>
10					
11	<b>Existing Customers</b>				
12	×				+
13	<b>% Retained after Churn</b>				
14	=				
15	<b>Retained Customers (Goal)</b>	×	<b>Average Purchases per Period</b>	=	<b>Existing Customer Revenue</b>
16					=
17					<b>Total Revenue</b>

# Transparency and Continued Relevance



Documenting as you go is the only way to keep this process transparent.

# Formal Review of Inputs and Logical Flows

Reviews may occur at various development stages of a project



# Data, Assumptions and Estimates



Data



Assumptions



Estimates

Time-series assumptions  
Value assumptions  
Event assumptions

# Gathering FP&A Data and Assumptions



# Data Sources



Information Systems



People

# Data and Assumptions from External Sources



# Discussion Question

Match the following:



Answer:

<b>B</b>	Data	<b>A</b>	Casual or methodical assumptions made about the value of data
<b>C</b>	Assumptions	<b>B</b>	Objective and verifiable facts that are often expressed in numerical form
<b>A</b>	Estimates	<b>C</b>	Axioms, hypotheses or projections about past, current or future conditions, data, or business decisions

# Establish Collection Policies and Procedures

The estimate or assumption

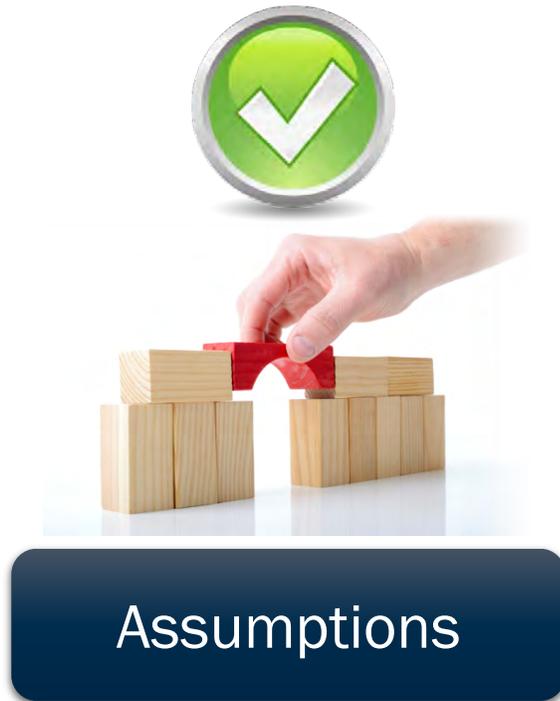
The name of the person who provided the estimate/assumption

The date that the estimate or assumption was made

Notes regarding assumptions the provider made when generating an estimate so that estimates from other sources are comparable



# Knowing When Estimates/Assumptions Are Needed



# Start an Information Gap Analysis

No data are available on the subject at all.

Data are not available for the time period in question (i.e., either a future period or a gap in a historical time sequence).

Data are unavailable for the business unit, product, customer segment or geographic region in question.

Data are noisy (outliers or corrupted data).

Data are incomplete, for example, not all costs are accounted for.

Data are considered too unreliable to use without corroboration.

Information providers have yet to provide requested estimates or assumptions



# Continue the Information Gap Analysis

Perform a preliminary data review

Determine why data are missing or incorrect

Identify which information gaps are critical and material

Identify and contact owners of required information

Seek alternative sources of information

Use proxies and assumptions to fill remaining gaps

Methods of arriving at proxies and assumptions

Questioning proxies and assumptions

Ongoing data and assumptions collection



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Part 2

Domain 3: Models and Analytics

Chapter 6: Specifying Outputs and

Getting Inputs

## **Part 2**

### **Domain B: Models and Analytics**

#### **Chapter 7: Improving the Quality of Information**

# Improving the Quality of Information

## *Topics Overview*

- *Combine/Aggregate Data*
- *Validate Data*
- *Identify Outliers and Determine Causes*
- *Check for Bias*
- *Perform Common Statistical Functions*
- *Apply Version Control and Back-Up Concepts and Techniques*
- *Set policies for Worksheet/BI Modeling and Documentation*

# Combining or Aggregating Data

## Combining Data

Involves downloading data from more than one information system or database and then merging the data into a single rectangular worksheet or database file. The data may need to be reformatted before or after they are combined so that the formatting is consistent and aggregation can occur.

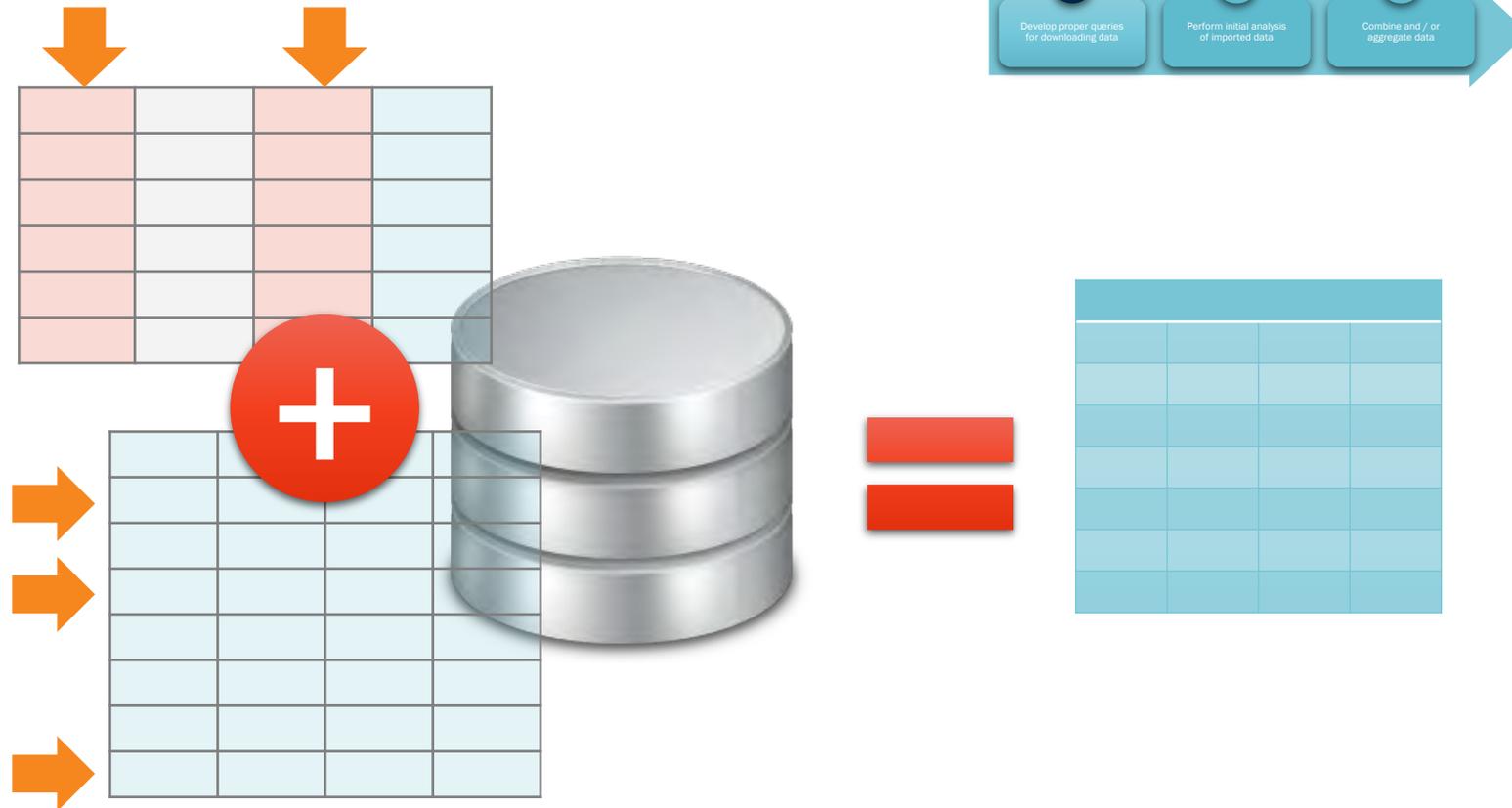
## Aggregation

Involves either summarizing numerical data or reducing the number of categories of categorical data.

# Process for Combining or Aggregating Data



# Step 1: Develop Proper Queries



# Step 2: Perform Initial Analysis of Imported Data

Therefore, don't assume that:

- Data have transferred correctly.
- Data entry was performed correctly.
- Data validation is working correctly.
- Anyone else reviewed the data for impossible, out-of-range, or missing values



# Step 3: Combine and/or Aggregate Data



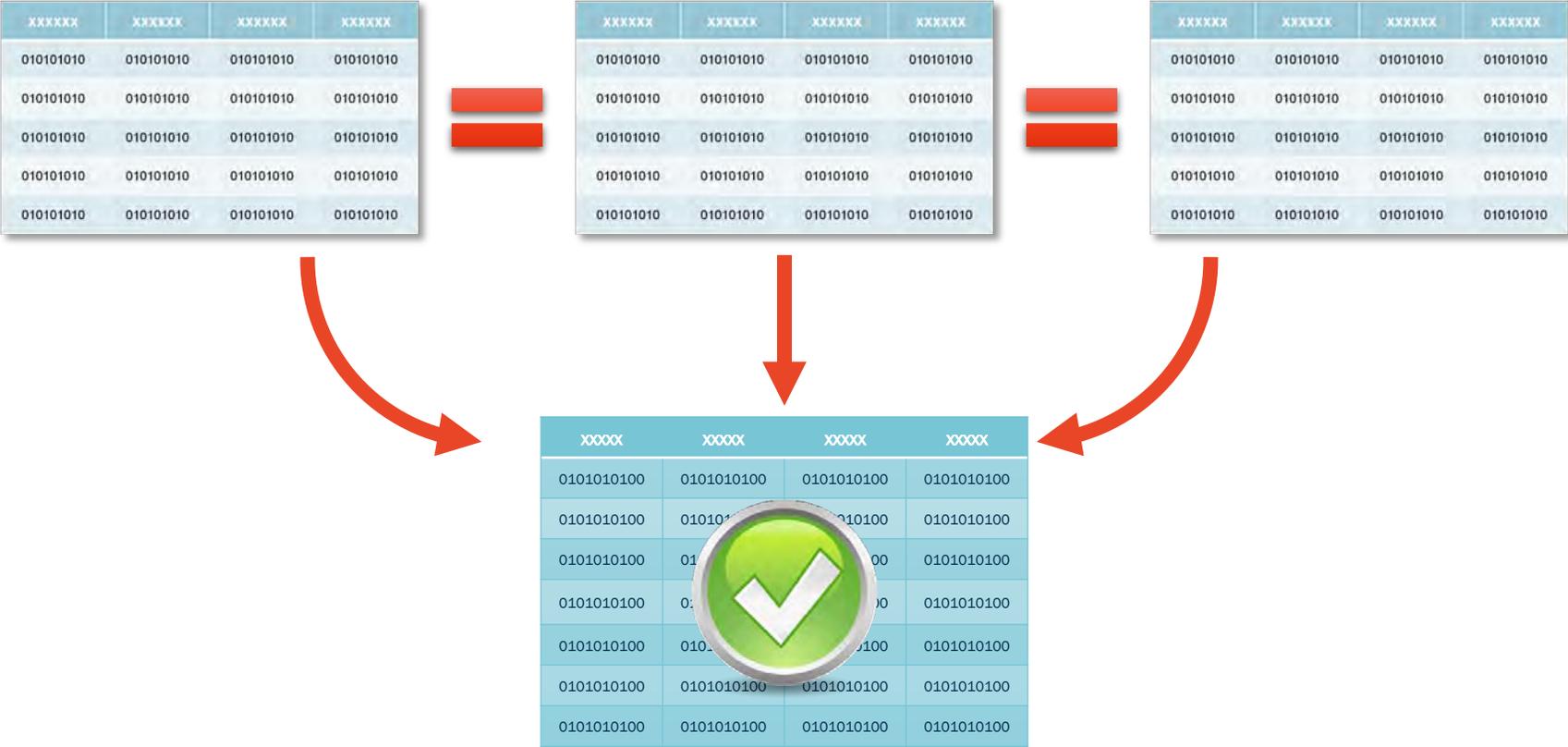
# Data Validation

 XXXXXX	 XXXXXX	 XXXXXX	XXXXXX
010101010	010101010	010101010	010101010
010101010	010101010	010101010	010101010
010101010	010101010	010101010	010  10
010101010	010101010	010101010	010101010
010101010	010101010	010101010	010101010

# Big-picture Understanding of the Organization



# Source Agreement



# Purpose of Identifying Outliers

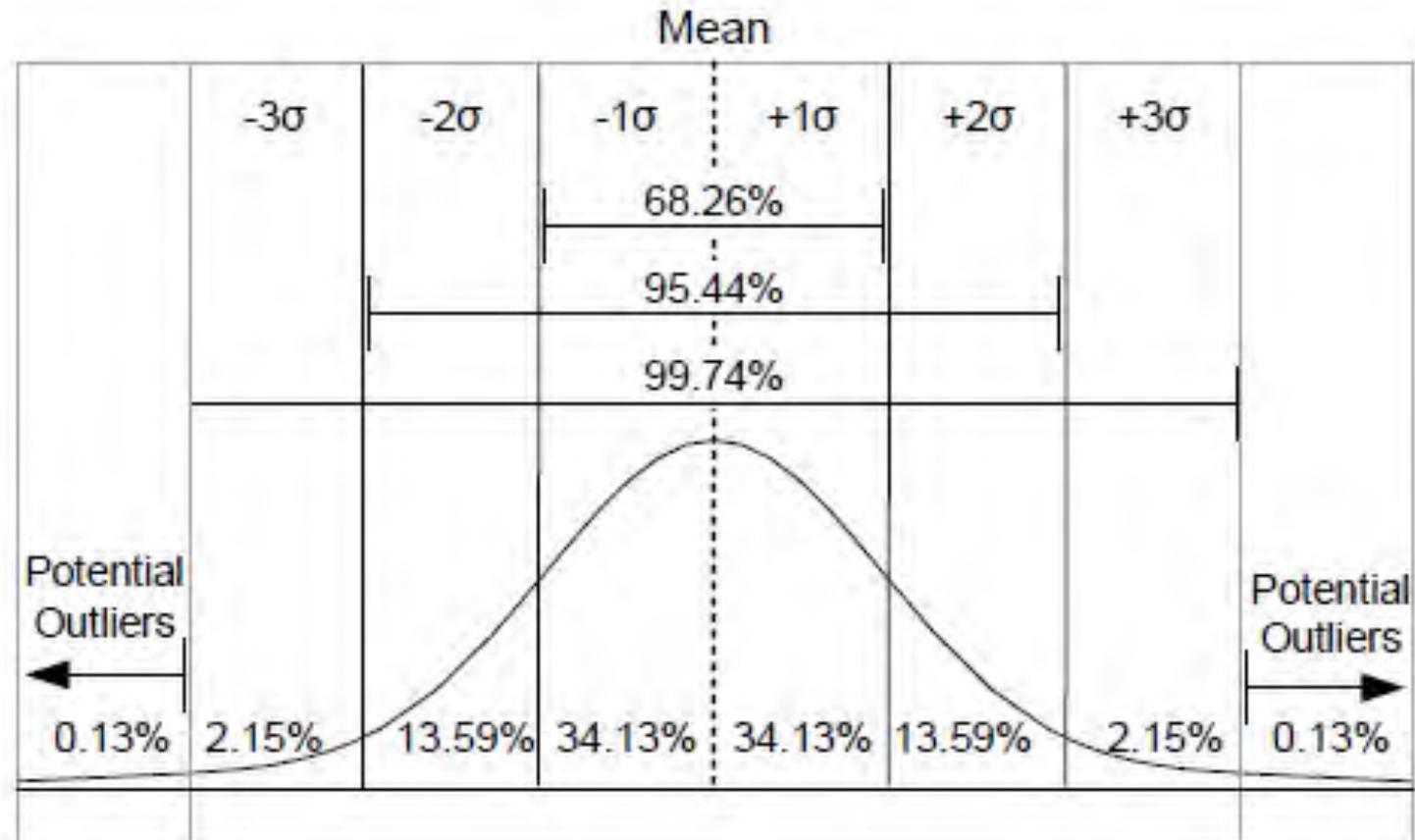
## Outlier

An outlier is any data value that differs significantly from the other data values in a set of data. Outliers can be data errors, unusual events or transactions that may or may not recur in the future, or anomalies that can be studied for their information value.

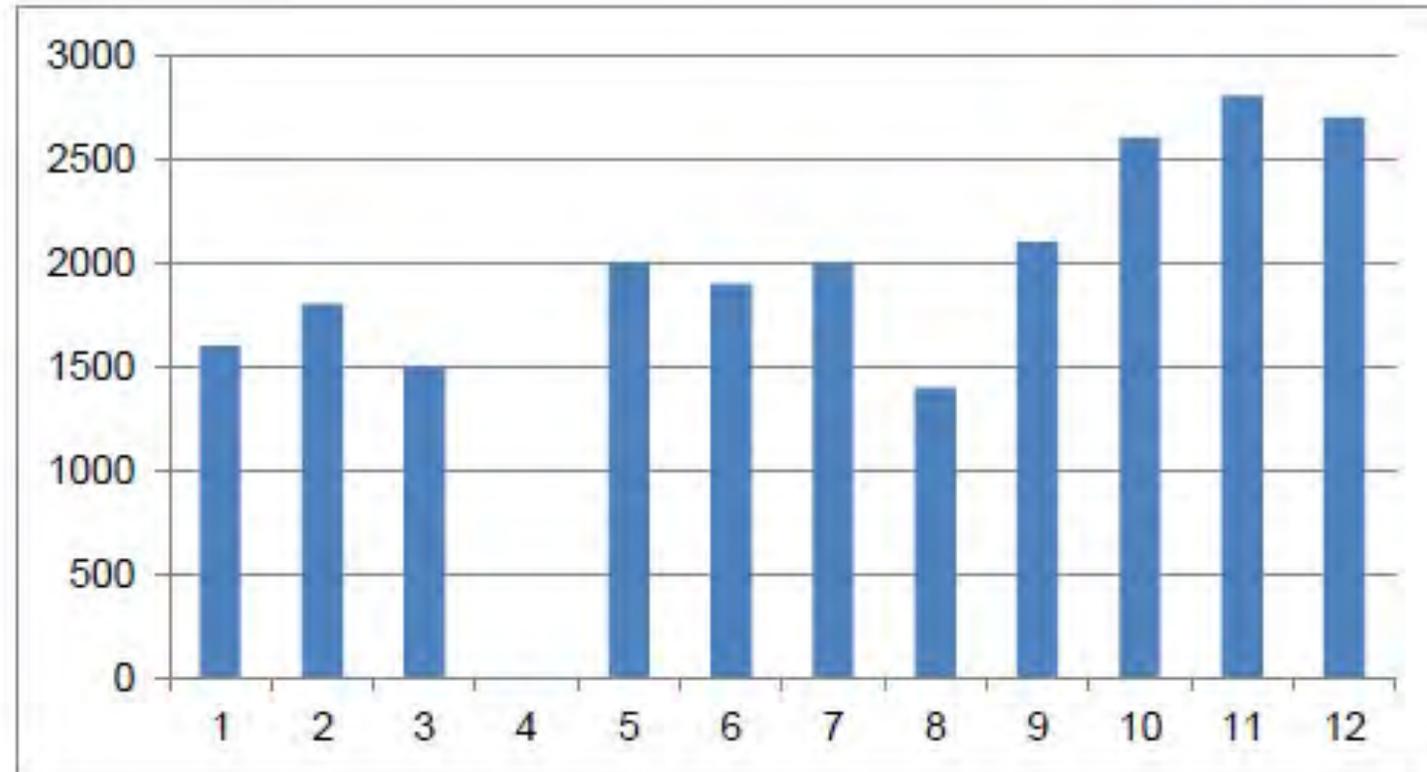
## Purpose of identifying outliers

- Find and correct errors.
- Determine whether the outlier will lead to erroneous findings, and if so, address in some way.
- Study non-error outlier for their information.

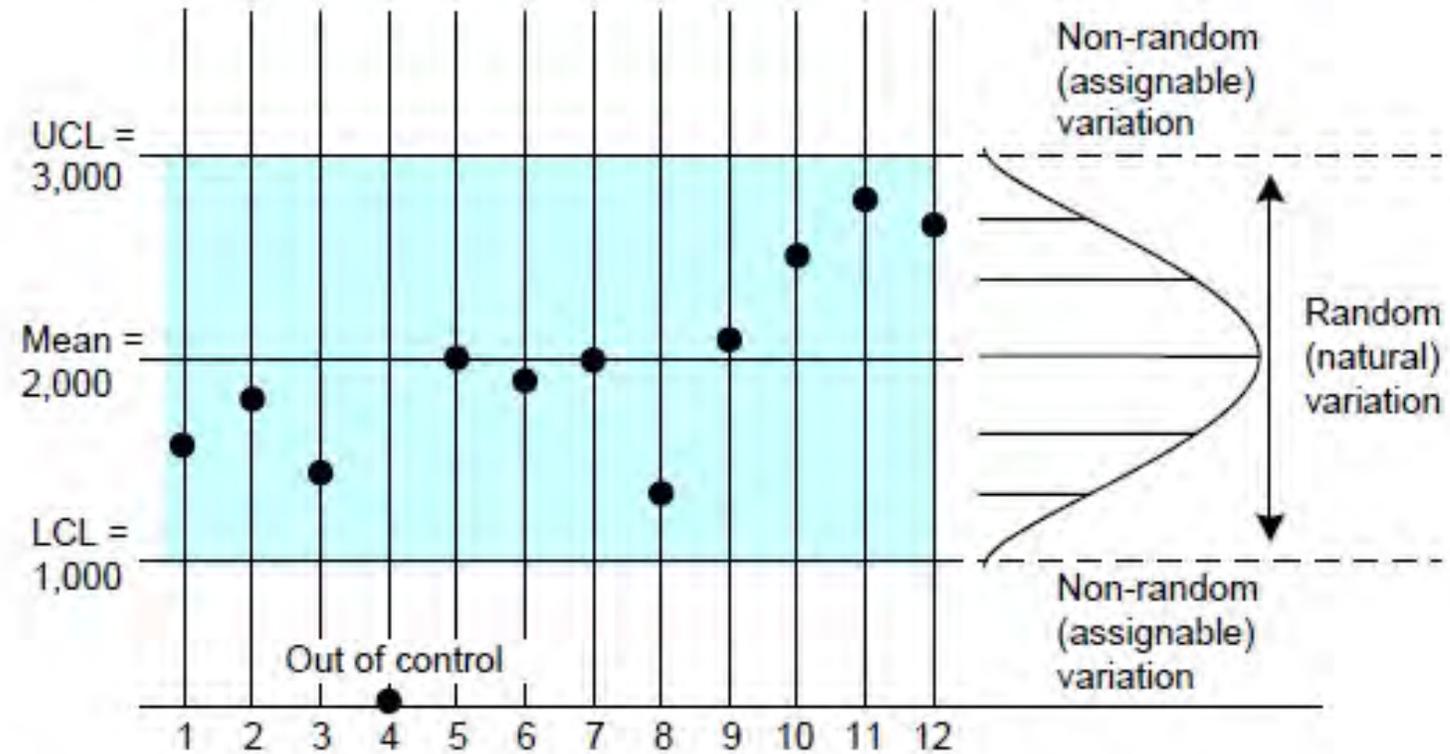
# Using Statistics to Explain Outliers



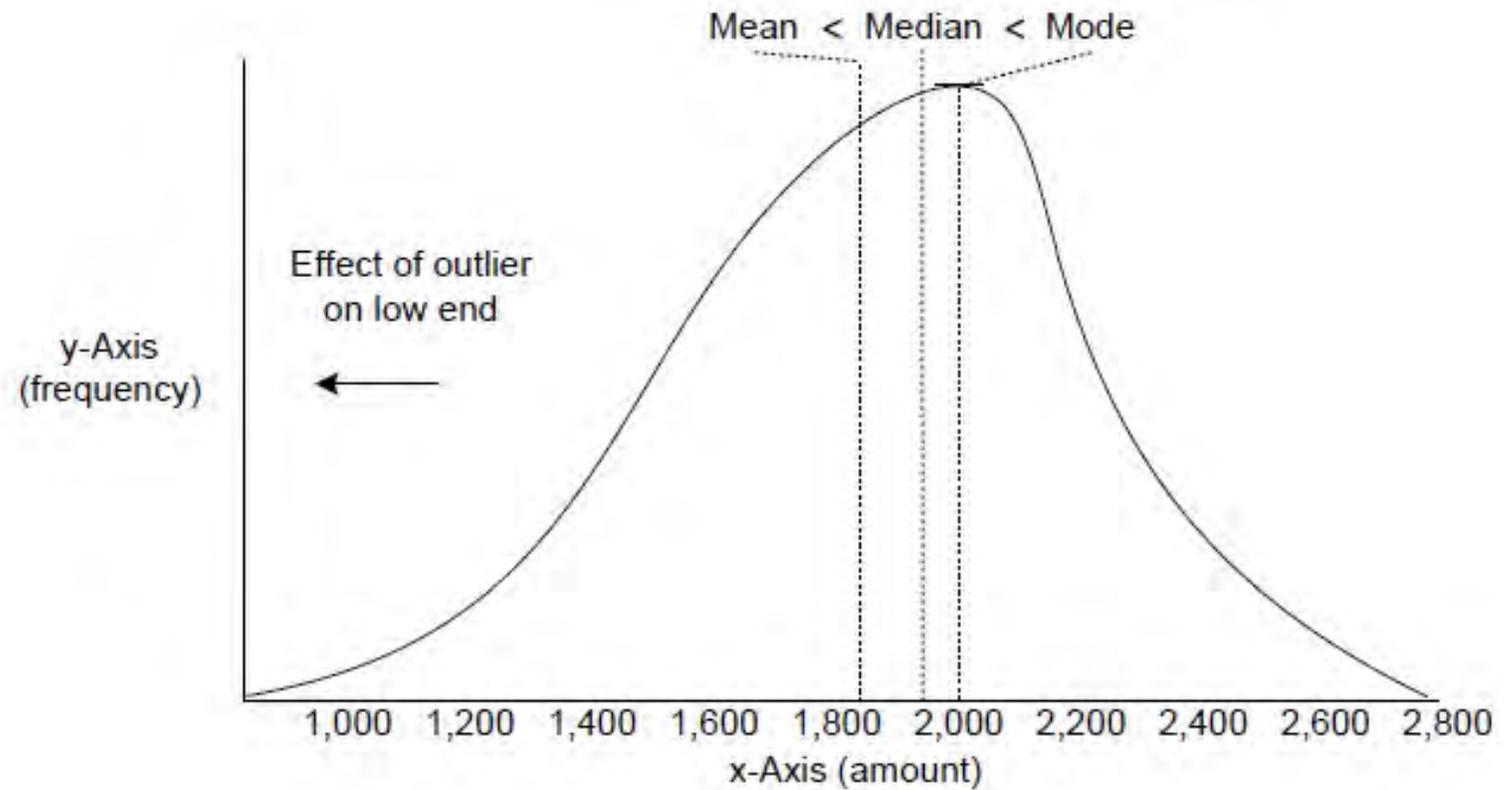
# Histograms



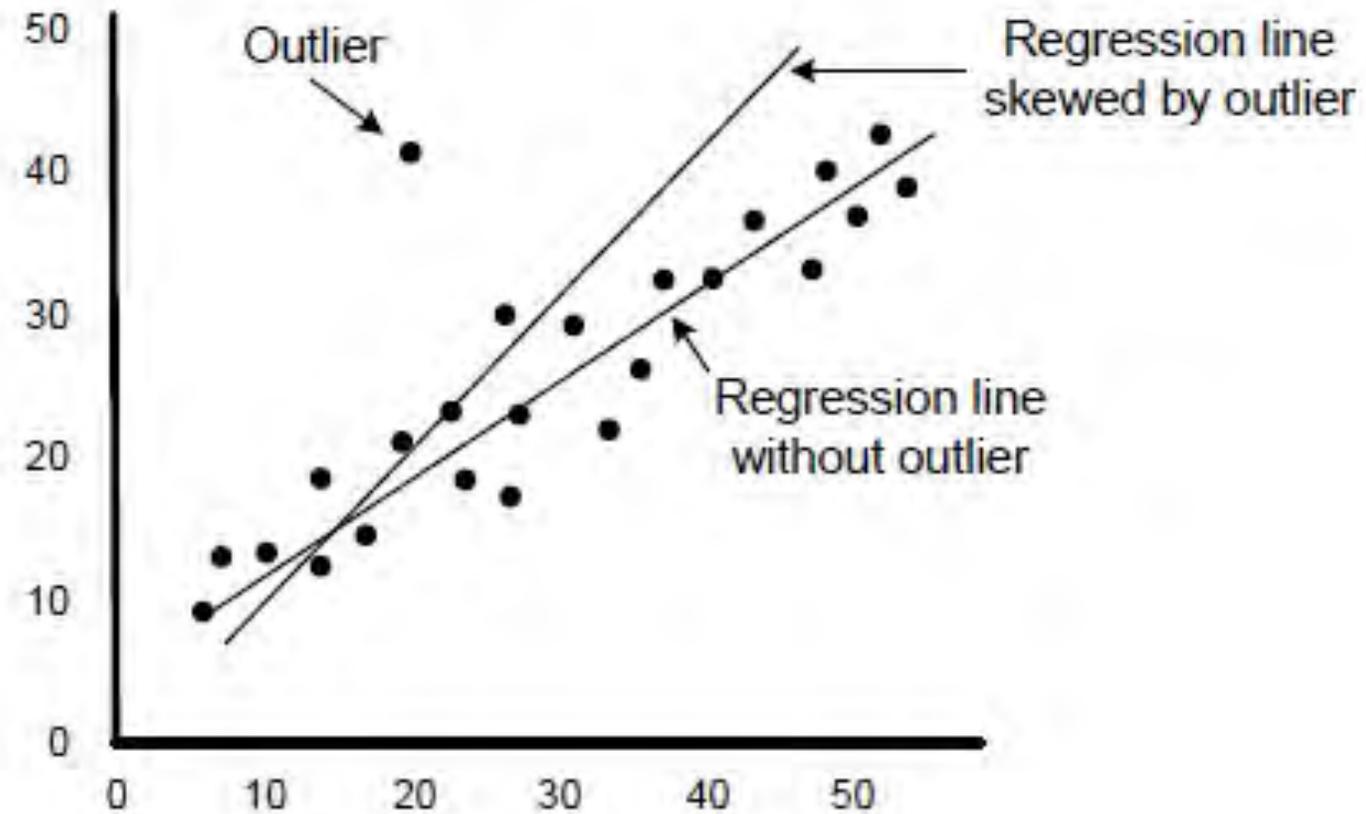
# Control Charts



# Frequency Distributions



# Regression Analysis



# Process for Addressing Outliers



# Bias & Objectivity

## Bias

A consistent or systematic deviation from the mean in either a high or low direction

## Objectivity

An unbiased mental attitude that requires FP&A professionals to exercise their expertise and best judgment when determining what should reasonably be expected and not subordinate that judgment to the influence of others if doing so would compromise objectivity

# Discussion Question



Match the bias to its definition.

Answers:

- |                               |  |
|-------------------------------|--|
| <b>D</b> Recency              | <b>A</b> Preference for a particular outcome is allowed to influence projections                 |
| <b>A</b> Optimism             | <b>B</b> Accepting information only if it confirms existing assumptions                          |
| <b>C</b> Inconsistency        | <b>C</b> Applying decision rules in irregular, unpredictable ways                                |
| <b>F</b> Selective Perception | <b>D</b> Ignoring experiences from the past and focusing on recent experiences only              |
| <b>E</b> Availability         | <b>E</b> Relying solely or predominantly on data that are easily available                       |
| <b>B</b> Confirmation         | <b>F</b> A person's area of specialization is allowed to dominate how he or she perceives issues |

# Eliminating Bias

## Logic

Using logic to question estimates and assumptions, leading the information provider in a dispassionate way toward more realistic values.

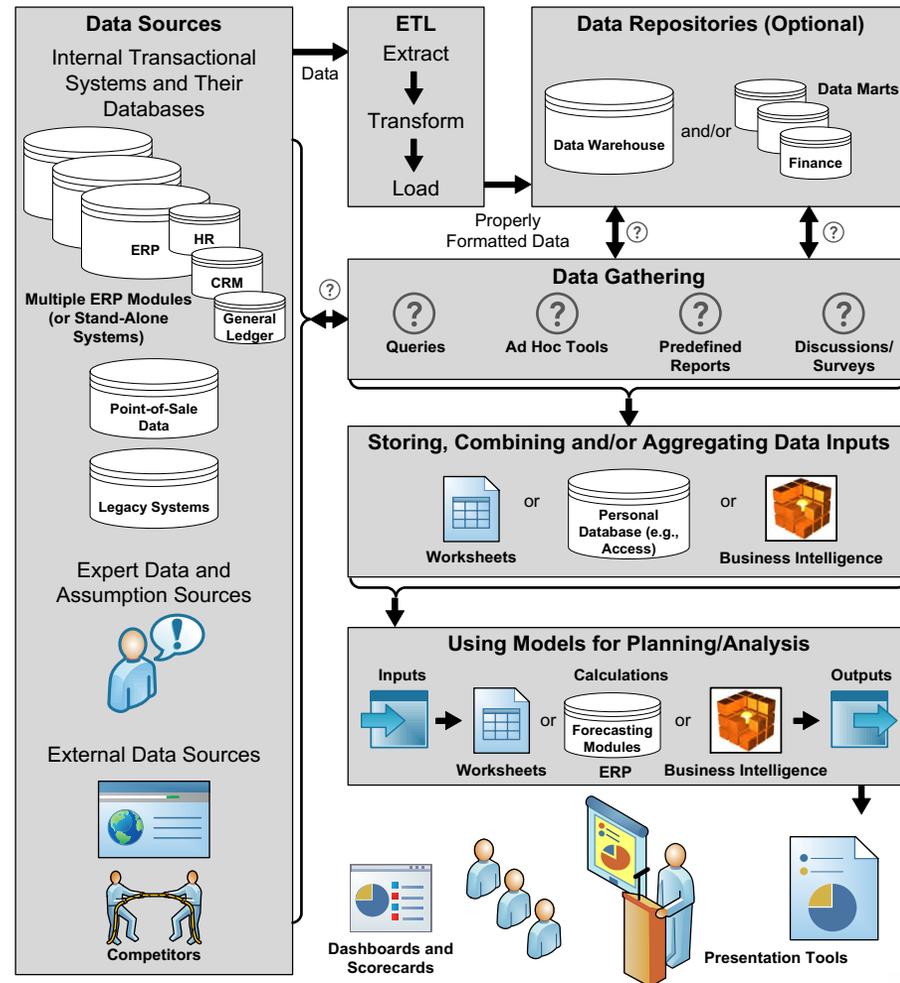
## Negotiation

Be the voice of reason, expressing concerns in a proper, intelligent manner that shows you have done your homework and have an understanding of the other person's perspective and goals.

## Corroboration

Supporting something with evidence or authority, with more weight being given to independent sources. This could include doing research, analysis of historical results, or getting the opinion of additional internal or external experts on the matter.

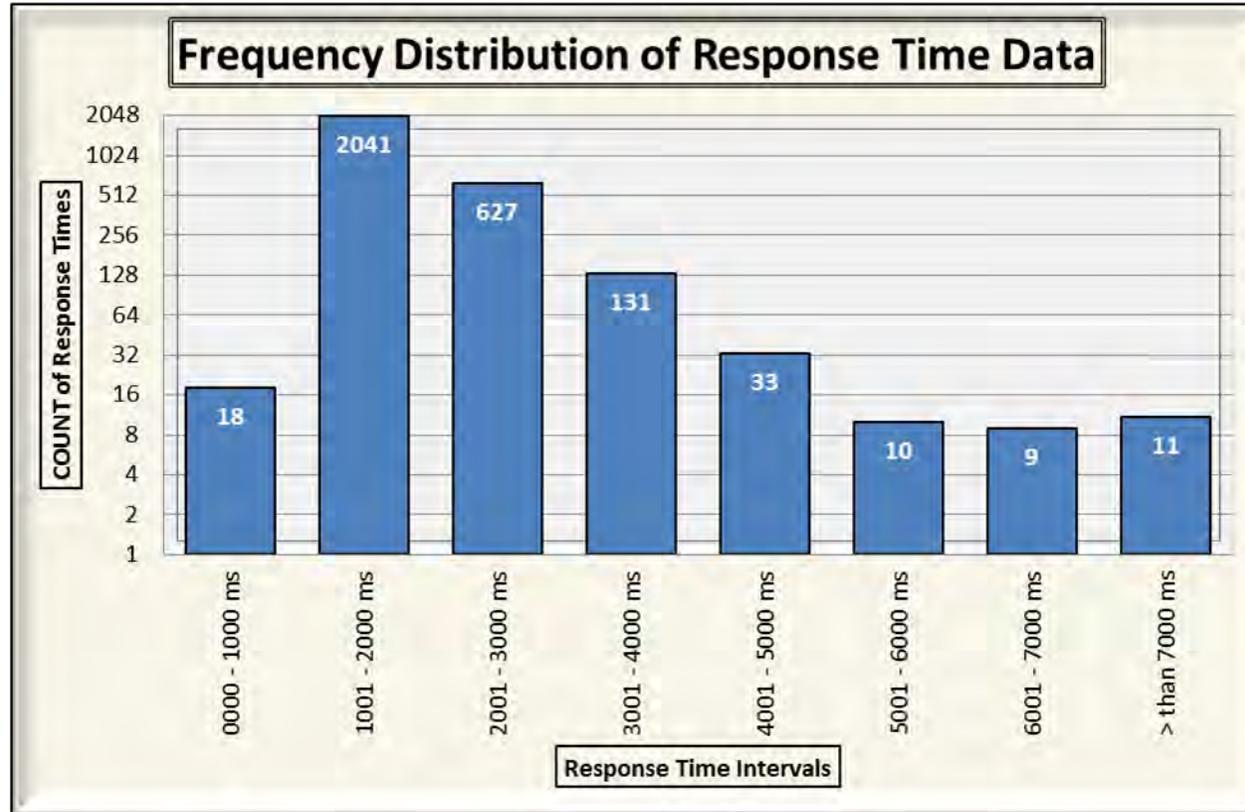
# Overview of Technology/Software Used in FP&A Function



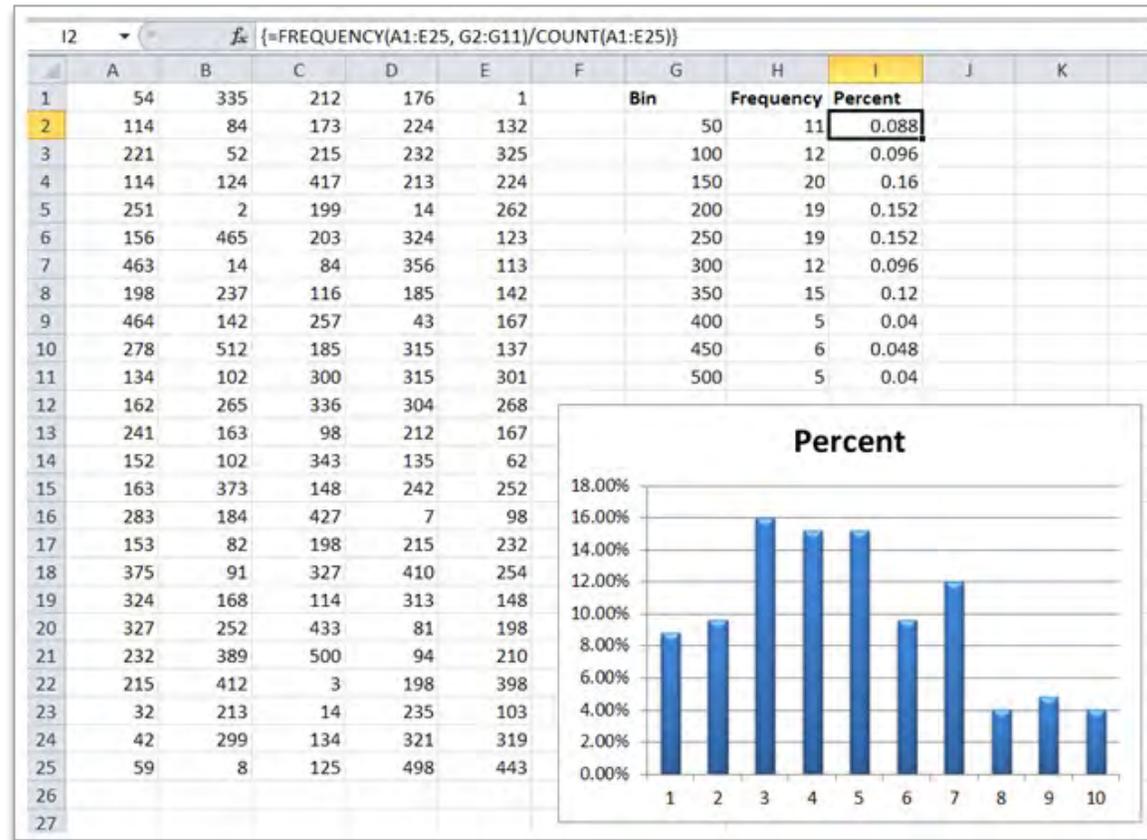
# Types of Statistical Analysis for Numerical or Categorical Data

	<b>Describing One or More Groups</b>	<b>Making an Inference About One Group</b>	<b>Comparison of Two Groups</b>
<b>Numerical Data</b>	<ul style="list-style-type: none"> <li>• Mean, mode, median</li> <li>• Frequency distribution</li> <li>• Ordered array</li> <li>• Percentage distribution</li> <li>• Standard deviation</li> <li>• Variance</li> <li>• Coefficient of variation</li> </ul>	<ul style="list-style-type: none"> <li>• Estimating confidence interval for the mean</li> <li>• t-Test for the mean</li> <li>• Chi-square test for variance</li> </ul>	<ul style="list-style-type: none"> <li>• Testing the difference between means from two independent populations</li> </ul>
<b>Categorical Data</b>	<ul style="list-style-type: none"> <li>• Charts</li> </ul>	<ul style="list-style-type: none"> <li>• z-Test for the proportion</li> </ul>	<ul style="list-style-type: none"> <li>• z-Test for the difference between two proportions</li> </ul>
	<b>Comparing Three or More Groups</b>	<b>Relationship Between Two Variables</b>	<b>Relationship Between Multiple Variables</b>
<b>Numerical Data</b>	<ul style="list-style-type: none"> <li>• Analysis of variance</li> </ul>	<ul style="list-style-type: none"> <li>• Scatter plot</li> <li>• Time series forecasting</li> <li>• Simple regression</li> <li>• t-Test of correlation</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple regression</li> </ul>
<b>Categorical Data</b>	<ul style="list-style-type: none"> <li>• Chi-square test for difference among three or more proportions</li> </ul>	<ul style="list-style-type: none"> <li>• Side-by-side bar chart</li> <li>• Pivot tables</li> <li>• Chi-square test of independence</li> </ul>	—

# Frequency Distributions



# FREQUENCY Function



# Analysis ToolPak Add-in and Data Analysis

The dialog box shows the following options:

**Analysis of variance (There are three types.)**

**Correlation**

**Covariance**

**Descriptive statistics**

**Exponential smoothing**

**F-Test**

**Fourier analysis**

- Histogram
- Moving average
- Random number generation
- Rank and percentile
- Regression
- Sampling
- t-Test
- z-Test

# Use Organizational Software/Data Version Control and Back-Up Policies and Procedures



# Develop Policies and Procedures for FP&A- Implemented Software/Data Version Controls

	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
	Expenses	% Total						
<b>Advertising</b>								
Print	\$10,000	11.6%	\$12,000	12.4%	\$10,000	11.6%	\$12,000	12.4%
Radio	10,000	11.6%	11,000	11.3%	10,000	11.6%	11,000	11.3%
Television	25,000	29.1%	28,000	28.9%	25,000	29.1%	28,000	28.9%
Direct Mail	30,000	34.9%	32,000	33.0%	30,000	34.9%	32,000	33.0%
Point of Purchase	5,000	5.8%	6,000	6.2%	5,000	5.8%	6,000	6.2%
Co-op	5,000	5.8%	7,000	7.2%	5,000	5.8%	7,000	7.2%
Other	1,000	1.2%	1,000	1.0%	1,000	1.2%	1,000	1.0%
<b>Totals</b>	<b>\$86,000</b>	<b>12.0%</b>	<b>\$97,000</b>	<b>13.1%</b>	<b>\$86,000</b>	<b>12.0%</b>	<b>\$97,000</b>	<b>13.1%</b>
<b>Sales Promotion</b>								
Trade Shows	\$2,000	15.4%	\$3,000	54.5%	\$2,000	15.4%	\$3,000	54.5%
Sales Force Promotion	10,000	76.9%	2,000	36.4%	10,000	76.9%	2,000	36.4%
Other	1,000	7.7%	500	9.1%	1,000	7.7%	500	9.1%
<b>Totals</b>	<b>\$13,000</b>	<b>1.8%</b>	<b>\$5,500</b>	<b>0.7%</b>	<b>\$13,000</b>	<b>1.8%</b>	<b>\$5,500</b>	<b>0.7%</b>
<b>G&amp;A</b>								
Clerical	\$100,000	27.5%	\$110,000	28.4%	\$100,000	27.5%	\$110,000	28.4%
Managerial	200,000	54.9%	210,000	54.3%	200,000	54.9%	210,000	54.3%
Telephone	40,000	11.0%	41,000	10.6%	40,000	11.0%	41,000	10.6%
Travel	15,000	4.1%	16,000	4.1%	15,000	4.1%	16,000	4.1%
Supplies	8,000	2.2%	9,000	2.3%	8,000	2.2%	9,000	2.3%
Other	1,000	0.3%	1,000	0.3%	1,000	0.3%	1,000	0.3%
<b>Totals</b>	<b>\$364,000</b>	<b>51.0%</b>	<b>\$387,000</b>	<b>52.3%</b>	<b>\$364,000</b>	<b>51.0%</b>	<b>\$387,000</b>	<b>52.3%</b>
<b>HR Development</b>								
Videos	\$1,000	2.7%	\$1,000	2.7%	\$1,000	2.7%	\$1,000	2.7%
Workshops	20,000	54.1%	20,000	54.1%	20,000	54.1%	20,000	54.1%
Tuition / Seminars	15,000	40.5%	15,000	40.5%	15,000	40.5%	15,000	40.5%
Other	1,000	2.7%	1,000	2.7%	1,000	2.7%	1,000	2.7%
<b>Totals</b>	<b>\$37,000</b>	<b>5.2%</b>	<b>\$37,000</b>	<b>5.0%</b>	<b>\$37,000</b>	<b>5.2%</b>	<b>\$37,000</b>	<b>5.0%</b>
<b>Sales Force</b>								
Motivational Programs	\$1,000	0.5%	\$1,000	0.5%	\$1,000	0.5%	\$1,000	0.5%
Recruiting	2,000	1.1%	2,000	1.1%	2,000	1.1%	2,000	1.1%
Salaries and Benefits	150,000	81.5%	150,000	81.5%	150,000	81.5%	150,000	81.5%
Telephone	20,000	10.9%	20,000	10.9%	20,000	10.9%	20,000	10.9%
Training	10,000	5.4%	10,000	5.4%	10,000	5.4%	10,000	5.4%
Other	1,000	0.5%	1,000	0.5%	1,000	0.5%	1,000	0.5%
<b>Totals</b>	<b>\$184,000</b>	<b>25.8%</b>	<b>\$184,000</b>	<b>24.8%</b>	<b>\$184,000</b>	<b>25.8%</b>	<b>\$184,000</b>	<b>24.8%</b>

# Sample Network Folder Structure



# Maintain a Development or Change Log

A bridge is a worksheet that provides details of the changes between a starting point and an ending point broken down by subcategory.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	<b>January 2014</b>													
2	<b>Bridge Between Budget and Actuals Showing Change in (Δ) Values per Account</b>													
3	<i>Columns in Green Denote Actuals</i>													
4		<b>Jan-14 Budget</b>						<b>Changes</b>					<b>Actuals</b>	
5			<i>Product 1</i>	<i>Product 2</i>	<i>Product 3</i>	<i>Product 4</i>	<i>Product 5</i>	<i>Product 6</i>	<i>Research Dept.</i>	<i>Recruiting Expenses</i>	<i>Sales Force</i>	<i>Stock Comp</i>	<i>Other</i>	
6	<b>Net Revenue</b>													
7	Gross Revenue	25,355	8,455	(2,761)	882	0	(338)	0	0	0	0	0	0	31,593
8	Product Returns	(847)	(647)	(29)	(18)	0	24	0	0	0	0	0	(210)	(1,728)
9	Prompt Payment Cash Discounts	(507)	(169)	62	(17)	0	7	0	0	0	0	0	0	(625)
10	Chargebacks	(6,880)	(465)	1,923	(127)	0	123	0	0	0	0	0	0	(5,427)
11	Price Adjustments & DSA Fees	(1,357)	(459)	(287)	(40)	0	34	0	0	0	0	0	0	(2,109)
12	Rebates (Medicaid, etc.)	(1,119)	(425)	450	0	0	3	0	0	0	0	0	0	(1,091)
13	<b>Total Net Revenue</b>	14,644	6,290	(642)	678	0	(146)	0	0	0	0	0	(210)	20,615
14	<b>Cost of Sales</b>													
15	Cost of Goods Sold	4,616	369	(14,514)	338	0	(9)	5	0	0	0	0	15	(9,182)
16	Royalty Expense	264	303	0	0	0	5	0	0	0	0	0	0	572
17	<b>Total Cost of Sales</b>	4,880	672	(14,514)	338	0	(5)	5	0	0	0	0	15	(8,610)
18	<b>Gross Profit</b>	9,764	5,618	13,872	341	0	(141)	(5)	0	0	0	0	(225)	29,225
19	<b>SG&amp;A</b>													
20	Sales and Marketing	3,594	980	(311)	17	(217)	0	52	0	18	(52)	29	34	4,145
21	General and Administrative	1,965	42	(114)	(111)	1	0	13	(172)	31	0	95	(309)	1,442
22	<b>Total SG&amp;A</b>	5,560	1,023	(425)	(94)	(216)	0	64	(172)	49	(52)	124	(274)	5,587
23	Research and Development	448	(145)	29	0	(281)	(20)	(75)	0	0	0	0	0	(44)
24	Transaction Related Expenses	144	0	0	0	0	0	0	0	(7)	0	0	(63)	73
25	Less Depreciation	93	0	0	0	0	0	0	0	0	0	0	(26)	67
26	Chge. in Acquisition Related Contingent Pmts.	0	0	0	0	0	0	0	0	0	0	0	(137)	(137)
27	Other Operating Expenses	0	0	13,388	0	0	0	0	0	0	0	0	0	13,388
28	<b>EBITDA</b>	3,520	4,740	881	435	497	(122)	6	172	(42)	52	(124)	276	10,290
29														
30	Depreciation Expense	93	0	0	0	0	0	0	0	0	0	0	(26)	67
31	Amortization	2,032	0	0	(863)	0	(9)	0	0	0	0	0	0	1,159
32	<b>Operating Profit</b>	1,395	4,740	881	1,298	497	(113)	6	172	(42)	52	(124)	302	9,063



# Documentation Policies and Procedures



**FPAC**<sup>™</sup>

**CERTIFIED CORPORATE  
FINANCIAL PLANNING &  
ANALYSIS PROFESSIONAL**

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Part 2

Domain 3: Models and Analytics

Chapter 7: Improving the Quality of  
Information

## **Part 2**

### **Domain B: Models and Analytics**

#### **Chapter 8: Refining Data, Risks and Opportunities, and Plans**

# Refining Data, Risks and Opportunities, and Plans

## *Topics Overview*

- *Integrate Financial/Non-Financial Data*
- *Analyze Risks and Opportunities*
- *Refine Plans, Including Assumptions and Scope*
- *Understanding Business Drivers' Financial Impact*
- *Develop and Evaluate Alternative Courses of Action*

# Integrate Financial/Non-Financial Data

## Quantitative data

- **Integers:** positive or negative whole numbers (0 too). Integers are used for discrete variables. Example: Countable units of inventory
- **Real numbers:** values appearing on a number line (decimals, fractions). Real numbers are used for continuous variables. Example: Interest expense, weight, height

## Measurement scales for quantitative data

- **Ratio scale:** Zero has a representative value
  - Most quantitative financial variables are measured on a ratio scale
- **Interval scale:** Zero is arbitrary
  - Temperatures and dates in worksheets

# Quantitative Data

## Normalization

- Or normalizing
- Common-sizing financial statements
- Z-score approach

## Discretization

- Changing a numerical value into a categorical value
- E.g., Revenue bands for firms: Category 1 = Revenues  $\leq$  \$100M; Category 2 = Revenues  $>$  \$100M

# Qualitative Data: Categorical Values

## How to transform categorical values into “usable” values?

- *If-then* statements to form binary values (or dummy variables)
- Transforming fiscal quarters to values such as 1, 2, 3, or 4

## Measurement scales for qualitative data

- **Ordinal Scales:** Values can be ranked, but differences between categories are not meaningful.
  - E.g., Credit Ratings
- **Nominal Scales:** Values should not be ranked (true/false, etc)
  - Can be transformed to binary to provide info

# Risk and Opportunities (R&O)

**R&O Schedule lists risks and opportunities together so their net impact can be determined. Impact is calculated by multiplying the financial impact by the probability**

- Factors can be sourced from the Opportunities and Threats from SWOT analysis
- The purpose of identifying R&Os together on one schedule is to help show where risks and opportunities can offset one another.



# Refine Plans, Including Assumptions and Scope

When refining assumptions, revisit all information collected thus far and determine whether it is still fairly representative

Degree of detail needed in model?

- *Model should be no more detailed/complex than is necessary*

# Determining Whether Data is Relevant/Irrelevant

- **What factors are relevant to the project at inception or to an ongoing project?**
- **Including sunk costs can distort or bias against the viability of a project**
- **Marginal revenues and cost savings are key**

# The Financial Impact of Business Drivers

Financial impact with respect to: Revenues (Price or Quantity), profit, cash flow, risk, or capital budgeting metrics

External or internal drivers

- P.E.S.T.L.E. provides several external business drivers

Value driver tree

# Developing and Evaluating Alternative Courses of Action

Capital rationing

Mutually exclusive investments

- Differences in timing of cash flows
- Unequal lives

# Capital Rationing

Capital Constraint = \$1,600		
Project	Initial Investment	NPV
A	\$900	\$450
B	\$800	\$405
C	\$300	\$120
D	\$500	\$150

# Evaluating the Combinations with Capital Rationing

Capital Constraint = \$1,600		
Project Combinations	Aggregate Initial Investment	Aggregate NPV
A + C	\$1,200	\$570
A + D	\$1,400	\$600
B + C	\$1,100	\$525
B + D	\$1,300	\$555
<b>B + C + D</b>	<b>\$1,600</b>	<b>\$675</b>
C + D	\$800	\$270

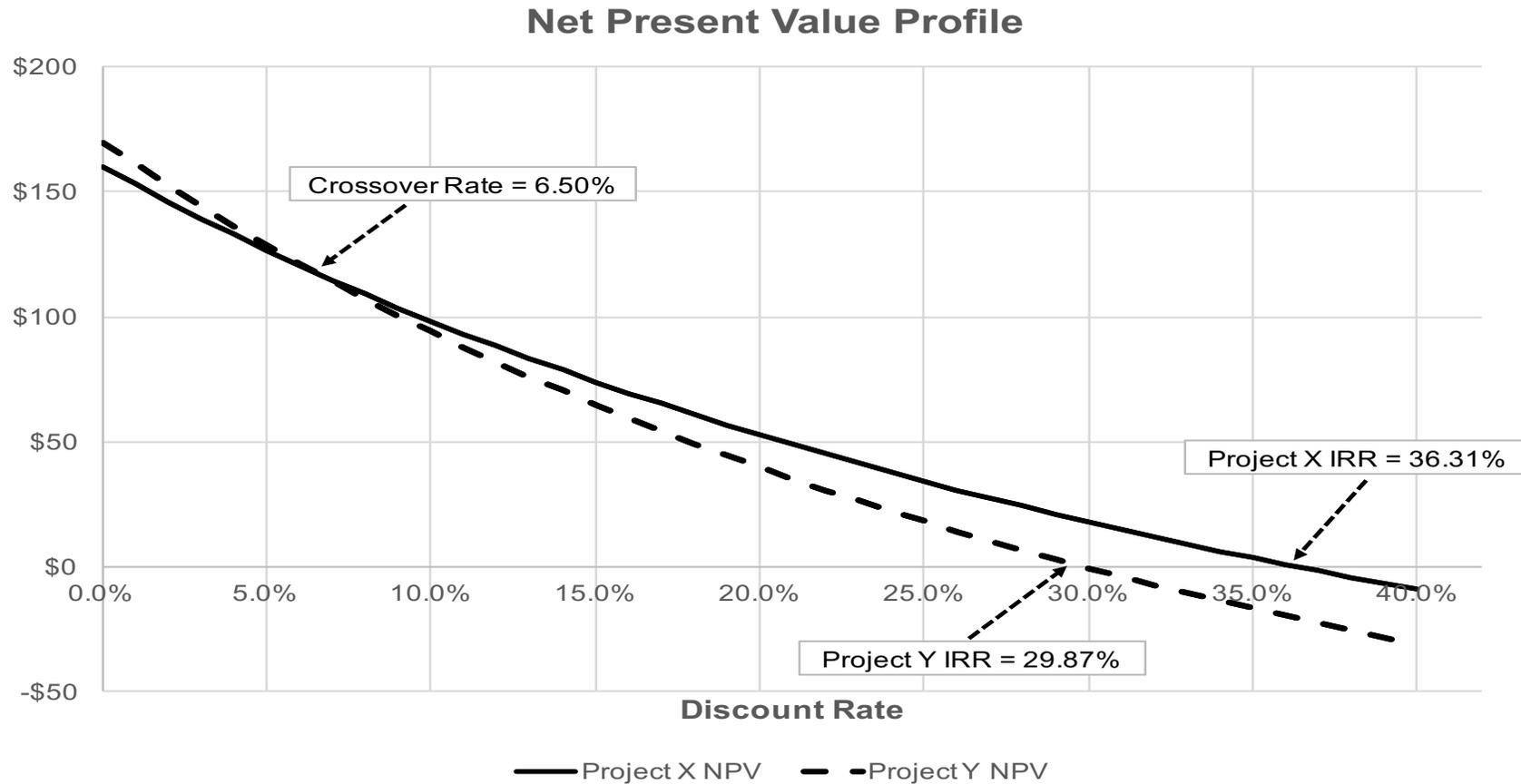
# Mutually Exclusive Investments: Timing Differences

Year	Project X Cash Flows	Project Y Cash Flows
0	-\$200	-\$200
1	\$120	\$60
2	\$120	\$90
3	\$120	\$220
NPV @ WACC of 10%	\$98.42	\$94.21

# Mutually Exclusive Investments: Timing Differences

Required Return	NPV of Project X	NPV of Project Y
0%	\$160	\$170
5%	\$126.79	\$128.82
10%	\$98.42	\$94.21
15%	\$73.99	\$64.88
20%	\$52.78	\$39.81
25%	\$34.24	\$18.24
30%	\$17.93	(\$0.46)
35%	\$3.51	(\$16.76)
40%	(\$9.33)	(\$31.05)

# Mutually Exclusive Investments: Timing Differences



# Mutually Exclusive Investments: Unequal Lives

Year	Cash Flows from Purchasing Equipment from Supplier X	Cash Flows from Purchasing Equipment from Supplier Y
0	-\$1,000,000	-\$980,000
1	\$350,000	\$620,000
2	\$350,000	\$620,000
3	\$350,000	\$0
4	\$350,000	\$0
NPV at r = 10%	\$109,542.91	\$96,033.06

# Mutually Exclusive Investments: Unequal Lives

Solution? Replacement Chain or Equivalent Annual Annuity (EAA)

- Can the purchase be replicated in the future?

Steps for the EAA approach:

1. Calculate the NPV for the investments using their unadjusted useful lives
2. Calculate the annual annuity that will generate the NPV from Step 1 at the given discount rate over the investment's useful life
3. Choose the investment with the highest EAA

# Mutually Exclusive Investments: Unequal Lives

The EAA from buying from Supplier X:

$$\$109,452.91 = EAA_X * \left[ \frac{1 - \frac{1}{(1.10)^4}}{0.10} \right]$$

$$EAA_X = \$34,529.20$$

This value indicates that an NPV of \$109,452.91 earned over a four-year period at a discount rate of 10% is equivalent to a four-year annualized cash flow of \$34,529.20.

The EAA from buying from Supplier Y:

$$NPV_Y = -\$980,000 + \$620,000 \left[ \frac{1 - \frac{1}{(1.10)^2}}{0.10} \right] = \$96,033.06$$

$$\$96,033.06 = EAA_Y * \left[ \frac{1 - \frac{1}{(1.10)^2}}{0.10} \right]$$

$$EAA_Y = \$55,333.33$$

## **Part 2**

### **Domain B: Models and Analytics**

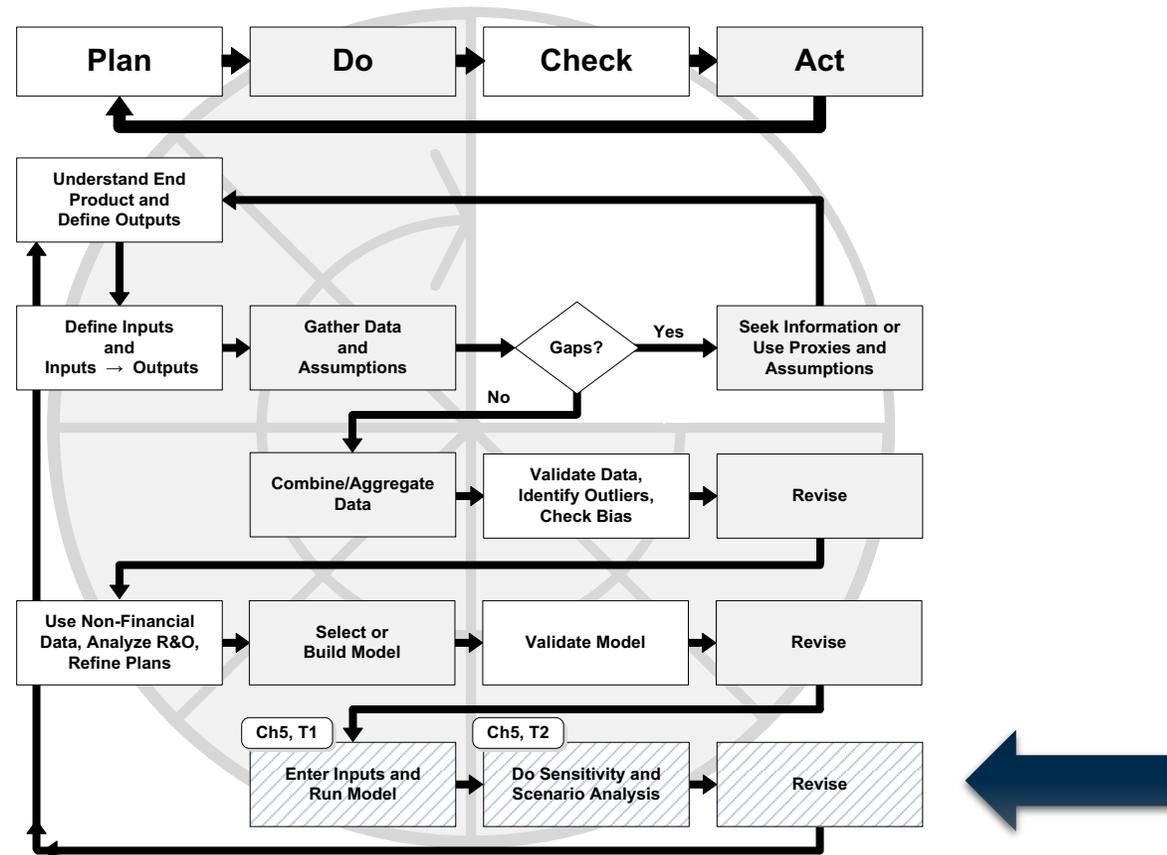
#### **Chapter 10: Using Models and Sensitivities/Scenarios**

# Using Models and Sensitivities/ Scenarios

## *Topics Overview*

- *Enter Inputs and Run Model to Form Initial Conclusions*
- *Test Reasonableness of Conclusions against Sensitivities, Scenarios or Simulations*
- *Model Interpretation*

# Location in the PDCA Cycle



# Are Conclusions Defensible?

## Quality: Using best practices in data validation and model building

- Also, choose appropriate benchmarks (think capital budgeting metrics) and consider stand-alone risk and diversification

## Objectivity: Opinion is based solely on inferences from the model

- Watch for biases; in particular confirmation bias

## Full Disclosure: Express the limitations and assumptions of the model

- Examples that you would like to discuss?

# Analysis Measures Defined

Sensitivity analysis	Scenario analysis	Monte Carlo simulation
Measures the effect on outputs when one input value is changed and all other input values are held constant at their expected values.	Measures the effect on outputs when multiple input values are changed simultaneously from their expected values to reflect a realistic situation that could occur.	A process conducted by simulation software that makes multiple trials (simulation runs) and, in each trial, the software varies each input variable semi-randomly on the basis of a probability distribution for each variable.

# Applied Sensitivity Analysis

**Assumptions: Your firm is examining the viability of investing in commercial real estate. The current asked price for the development is \$1.5M. If the property is purchased, then your firm will lease the property out on an annual basis for \$100,000 (assume beginning-of year cash flows) for each year of the property's holding period. The property will then be sold at the end of the second year. Assume a WACC of 10%.**

**You are uncertain about the residual value of the property, but you have determined the following potential values:**

- **Re-sell<sub>Best-Case</sub> = \$2.1M**
- **Re-sell<sub>Worst-Case</sub> = \$1.3M**

# Applied Sensitivity Analysis: NPV Analysis

$$\text{NPV}_{\text{Best-Case}} = -1,500,000 + 100,000 + \frac{100,000}{1.10^1} + \frac{2,100,000}{1.10^2} = \$426,446.28$$

$$\text{NPV}_{\text{Worst-Case}} = -1,500,000 + 100,000 + \frac{100,000}{1.10^1} + \frac{1,300,000}{1.10^2} = -\$234,710.74$$

# Applied Scenario Analysis

**Assumptions:** Your firm is examining the viability of investing in commercial real estate. The current asked price for the development is \$1.5M. If the property is purchased, then your firm will lease the property out on an annual basis for \$100,000 (assume beginning-of year cash flows). The property will then be sold at the end of the second year.

You are uncertain about the cost of capital and the residual value of the property, but you have determined the following potential values:

- $WACC_{\text{Best-Case}} = 7.5\%$ ,  $\text{Re-sell}_{\text{Best-Case}} = \$2.1\text{M}$
- $WACC_{\text{Worst-Case}} = 13\%$ ,  $\text{Re-sell}_{\text{Worst-Case}} = \$1.3\text{M}$

## Applied Scenario Analysis: NPV Analysis

$$\text{NPV}_{\text{Best-Case}} = -1,500,000 + 100,000 + \frac{100,000}{1.075^1} + \frac{2,100,000}{1.075^2} = \$510,221.74$$

$$\text{NPV}_{\text{Worst-Case}} = -1,500,000 + 100,000 + \frac{100,000}{1.13^1} + \frac{1,300,000}{1.13^2} = -\$293,413.74$$

# Monte Carlo Simulation

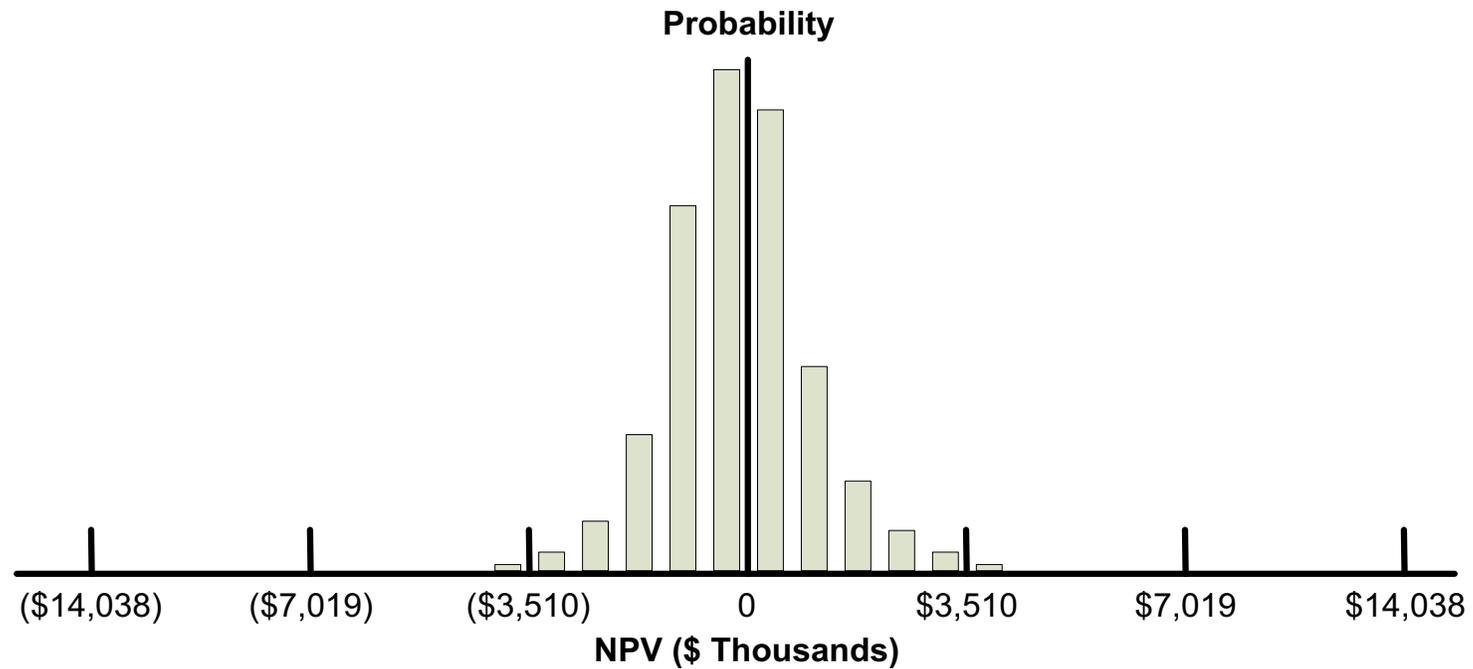
**Model is re-estimated many times using changes in multiple variables at a time.**

**Changes to the inputs follow the probability distribution specified by the user**

- Many probability distributions to choose from

**After generating the simulations, the user should calculate and examine the descriptive stats taken from the model output.**

# Monte Carlo Simulation Results via Histogram



# Making Conclusions with Capital Budgeting Metrics

Invest if

$NPV > \$0$

- Targeted value other than \$0 may be used in some cases

$IRR > WACC$

- Is the WACC the appropriate comparison rate? If the investment has a different risk level than the overall firm, then probably not
- Beware the possibility for multiple IRRs: Number of IRRs will equal the # of sign changes in the CFs

Profitability Index  $> 1.00$

Payback Period  $<$  what exactly?

- Discounted payback period is interpreted similarly

## **Part 2**

### **Domain B: Models and Analytics**

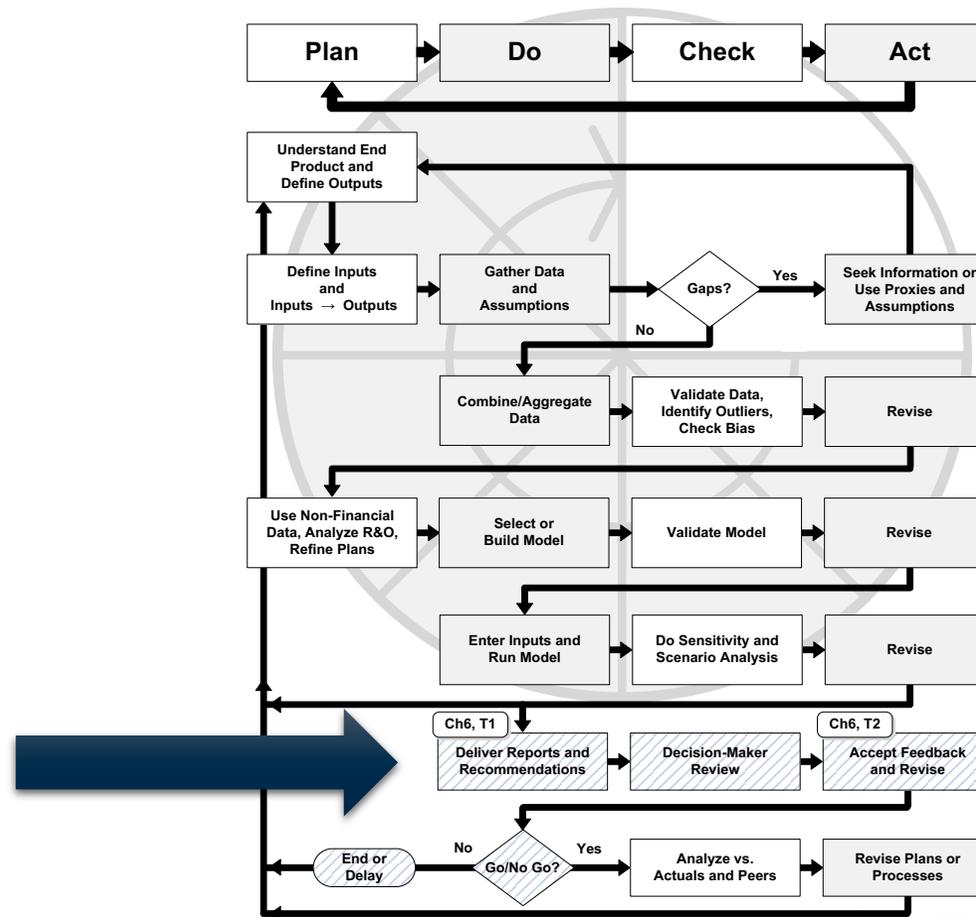
#### **Chapter 11: Making Conclusions and Recommendations**

# Making Conclusions and Recommendations

## *Topics Overview*

- *Draw Conclusions and Develop Formal Recommendations*
- *Receive Feedback and Revise Conclusions and Recommendations*

# Developing Model and Recommendations as PDCA Cycles



# Drawing Conclusions and Developing Formal Recommendations

**FP&A personnel should not assume that model outputs speak for themselves**

- Not everyone is fluent in finance and accounting

**Instead, present**

- Findings using a brief, high level summary
- Narratives of the model outputs
- Well-designed graphics and tables

**Conclusive evidence: *“Evidence from which any objective person would reach the same conclusion based on that evidence”***

# Understanding Presentation Scope

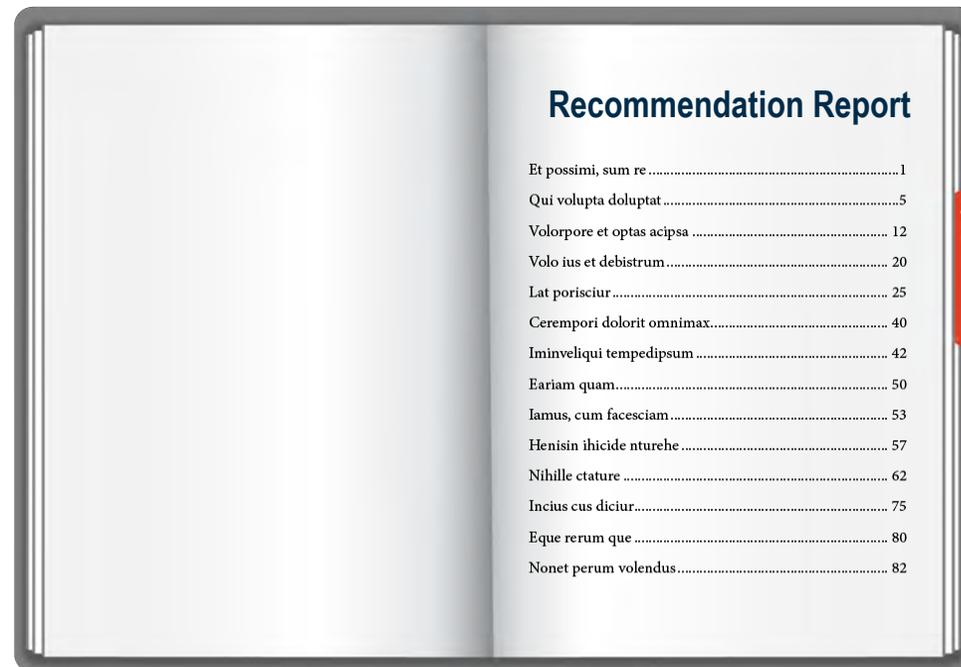
What factors should be considered when preparing to present conclusions and recommendations?

- Material impact and risk related to the end product
- Scope of the planning or analysis performed
- Time available for presentation
- Expected formality level of the presentation
- Significance of the conclusions and recommendations

# Components of Recommendation Reports

Most reports contain the following components:

- Report name and table of contents
- Executive summary
- Body of Report
  - Assumptions, key risks, results, ratios, etc.
- Appendices



# Discussion Question

True or False: The Body of the Report is a simple, cohesive argument made in plain language with a few key charts.



**Answer:**

**False.** The executive summary should summarize conclusions or recommendations addressed in the main report rather than making new assertions. The executive summary is a simple, cohesive argument made in plain language with a few key charts. The model flowchart and process could be here but may need to be simplified.

## Examples: Disclosing Assumptions

If it is a capital budgeting analysis, why was the given range of WACCs chosen?

If it is a financial planning model, why was the given range of revenue growth rates chosen?

# Deliver Judgment and Insight with Recommendations

## Seen As:

Recommendations should be seen as:

- Realistic
- Credible
- Actionable

## Dismissed As:

Recommendations should NOT be seen as:

- Unrealistic
- Suspect
- Unfeasible in light of business realities

# Mining Company Case Study

**BACKGROUND**

- ✦ Panama Exploration Ltd.
  - + Cash strat
  - + ~\$400M
  - + 540,000M
- ✦ Panama mi

**TABLE OF CONTENTS**

1. Background
2. Summary of Prop
3. Key Financial Ass
4. Panama Mine Bas
5. Sensitivity Analysi
6. Income Projection
7. Key Financial Rati
8. Risk and Opportu
9. Recommendation
10. Appendix

**PANAMA MINE PURCHASE ANALYSIS**

Presented by Director FP&A  
June 17, 2013



# Receive Feedback from Decision Makers

How do you decide whether feedback is biased or unbiased?



# Draw Final Conclusions

A key question to ask is, “Would a reasonable, prudent person who reviewed the data and assumptions and learned how results are calculated also reach the same conclusion?”



## **Part 2**

# **Domain C: Business Communication**

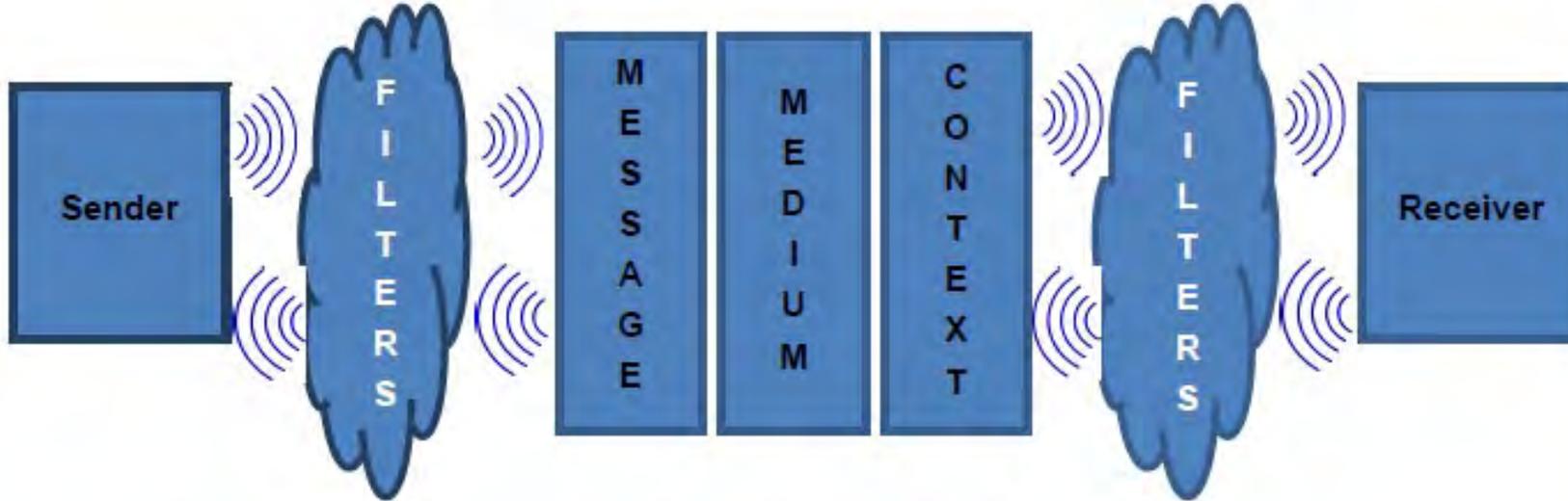
## **Chapter 12: Effective Communication**

# Effective Communication

## *Topics Overview*

- *Communication Essentials*
- *Effective Written Communication*
- *Effective Presentation Skills*

# Communication Model



# Effective Communication



Is focused

Strives for clarity

Is concise

Demonstrates awareness of the audience

Uses appropriate formats

Accommodates interaction

# Obstacles to Communication

Non-conducive environments

Audience resistance

Misunderstood messages



# Business Writing Basics

## Goals of written communication:

- 1 Enhance understanding and retention**
  - Use clear organization
  - Use front-end organizers
  - Avoiding digressions
  - Avoiding verbosity
- 2 Capture and keep the reader's attention**
- 3 Create and maintain credibility**

# Effective Presentations

Considerations:

Timing

How to present data

How to use slides

How to deliver the presentation



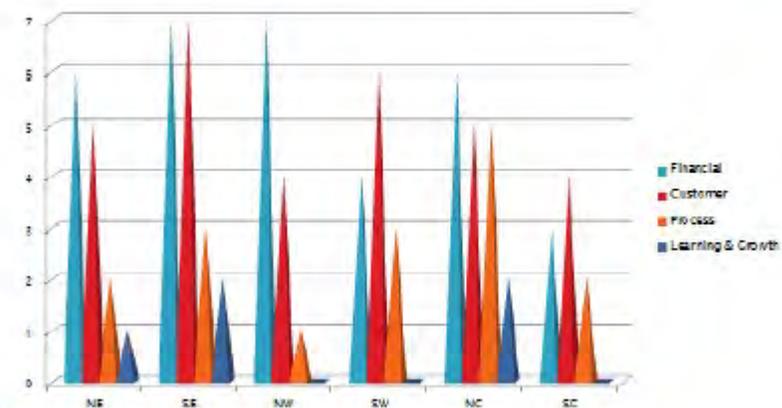
# Presenting Data Visually

## Balanced Scorecard Assessment Results *by division*

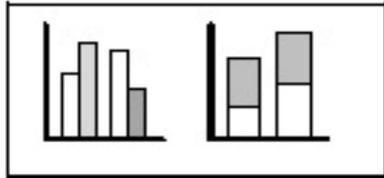
	Northeast	Southeast	Northwest	Southwest	North Central	South Central
Financial	6	7	7	4	6	3
Customer	5	7	4	6	5	4
Process	2	3	1	3	5	2
Learning & Growth	1	2	0	0	2	0
TOTAL	14	19	12	13	18	9



## Divisional Assessments vary.

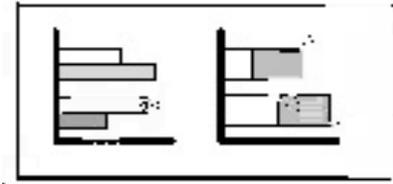


# Using Visuals



## Column Chart

Show trends or compare size; stacked versions show components that make up the total



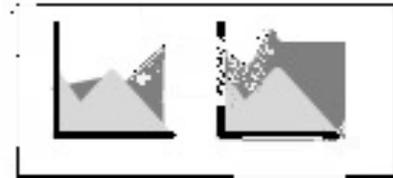
## Bar Chart

Show trends or compare size; Best when using long category labels or not a time series



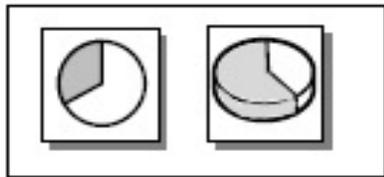
## Line Chart

Compare trends in continuous data



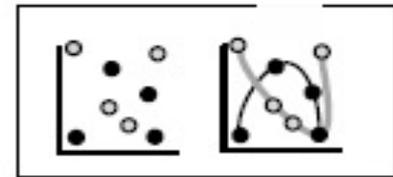
## Area Chart

Like a line chart with area filled in



## Pie Chart

Show proportions of a whole



## XY Scatter Chart

Show values on both the x- and y-axes; other charts show category on one axis, values on the other