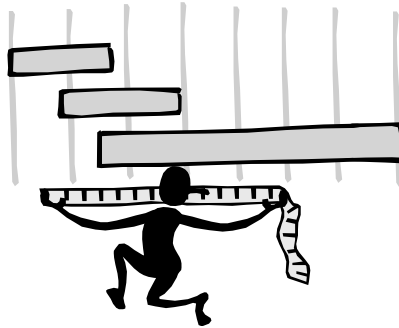


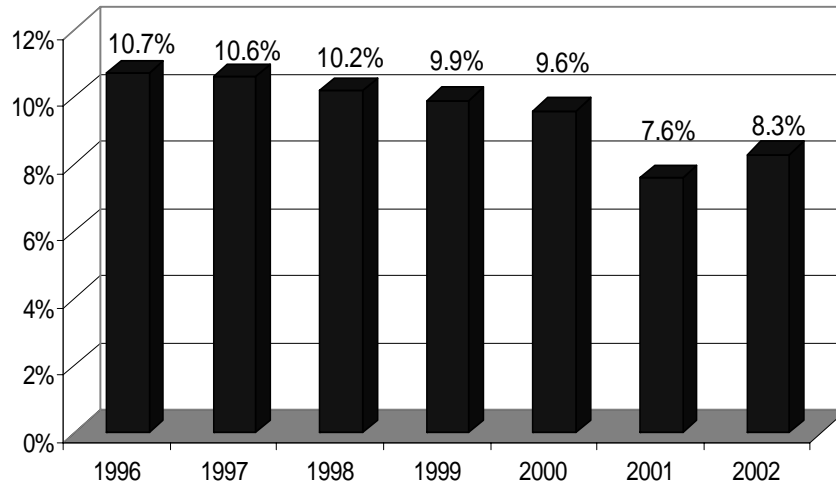
Chapters
13 & 15:



Supply Chain
Performance
Measurement
and Finance

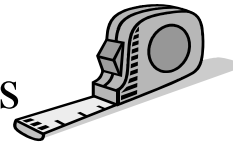
“If you can’t
measure it, you
can’t manage it.”

Some Financial Facts of Life: Return On Investment – S&P 500

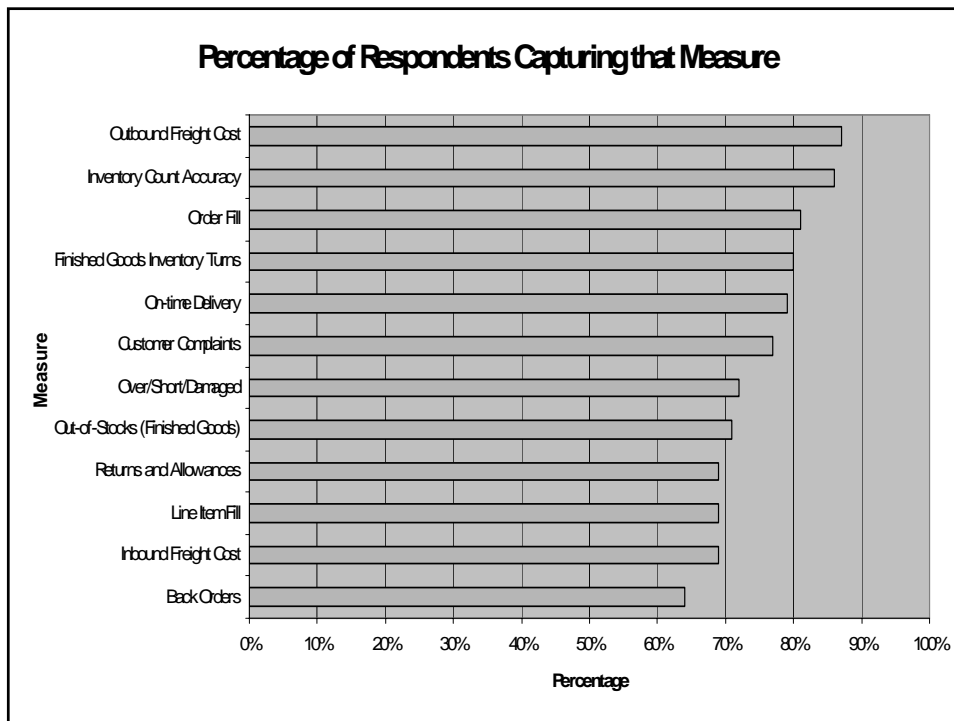
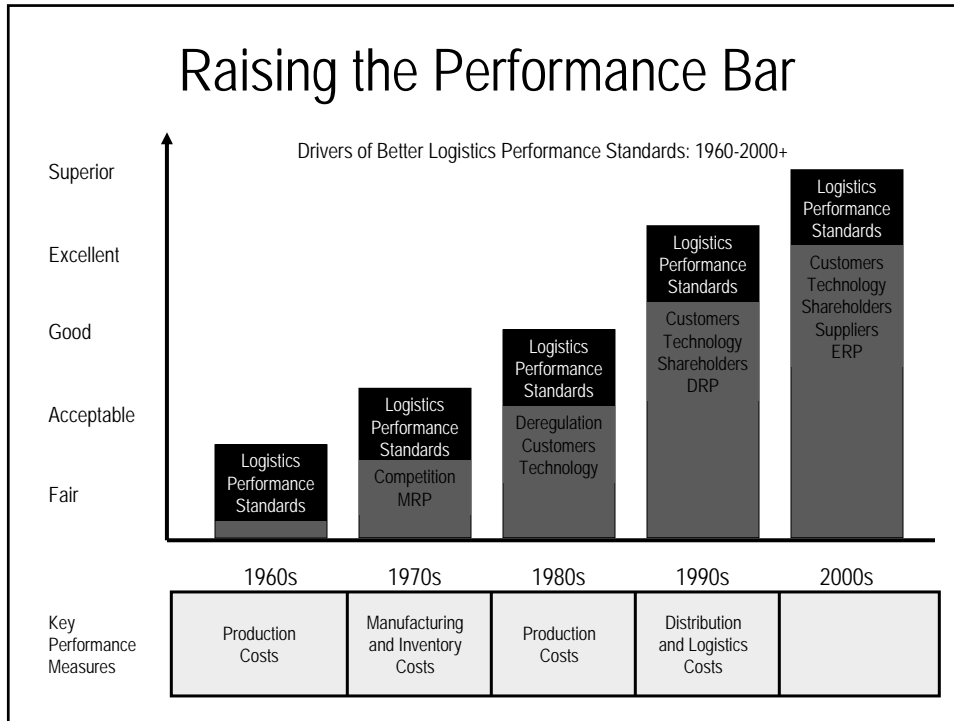


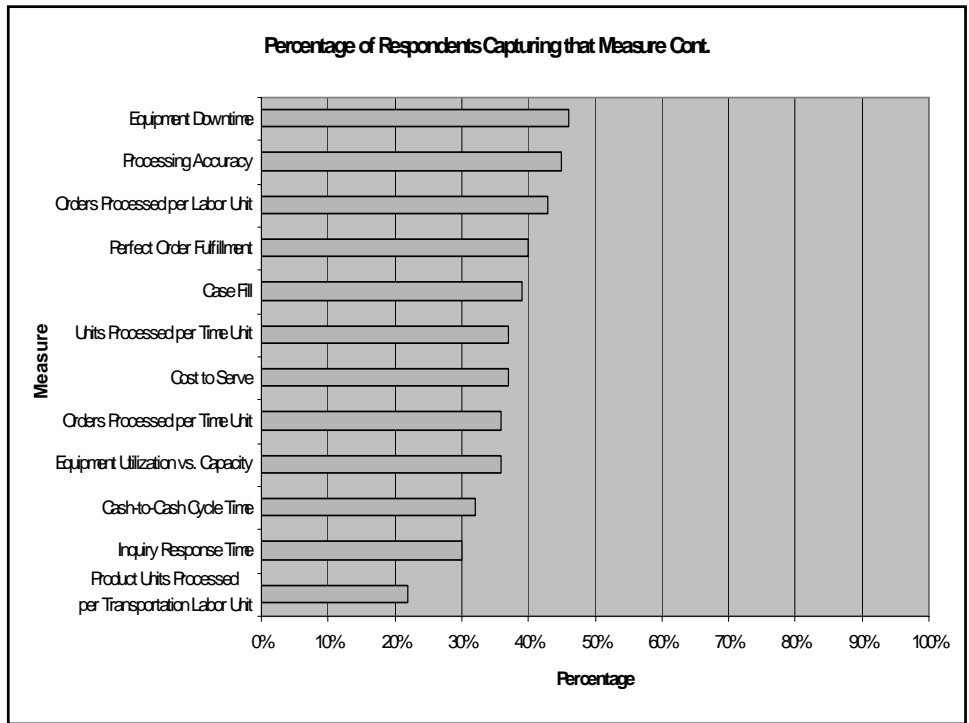
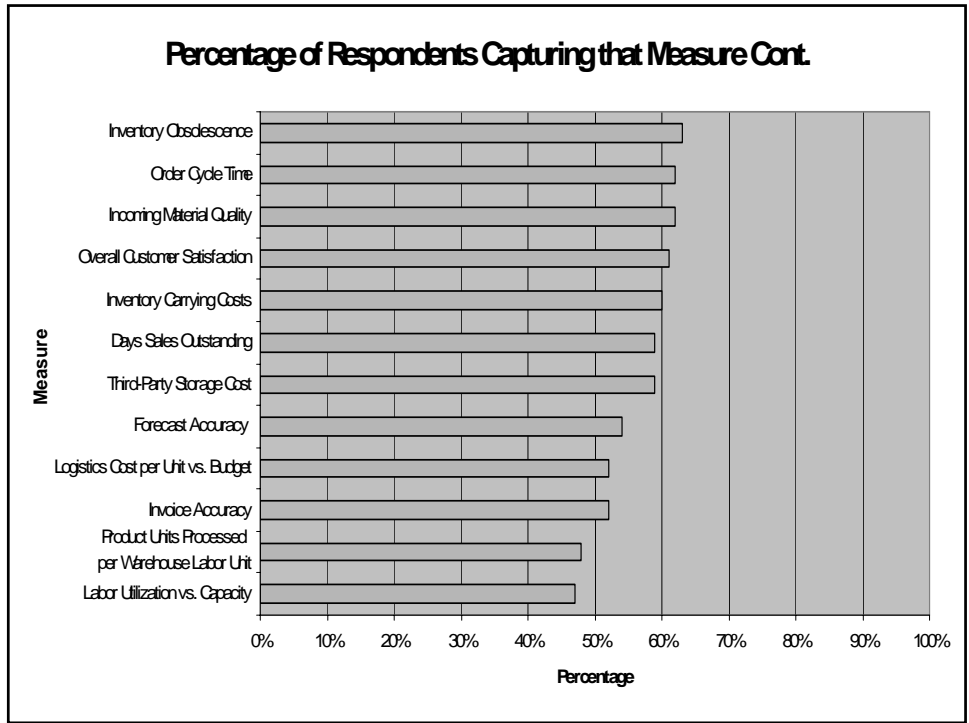
Source: Stephen Timme, FinListics Solutions.

Dimensions of Performance Metrics



- Establishing appropriate metrics is a complex problem.
 - Measuring inappropriate performance can lead to a company chasing the wrong goal.
 - Metrics drive behavior --- what you measure is what you get.
- Logistics metrics should focus on the total supply chain, not on just one link.





Characteristics of Good Measures

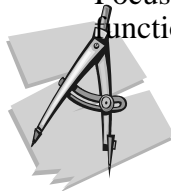
A Good Measure

- is easy to understand
 - is visible
 - encourages appropriate behavior
 - encompasses both outputs and inputs
 - uses economy of effort
 - facilitates trust
 - is multidimensional
 - is defined & mutually understood
 - measures only what is important
-

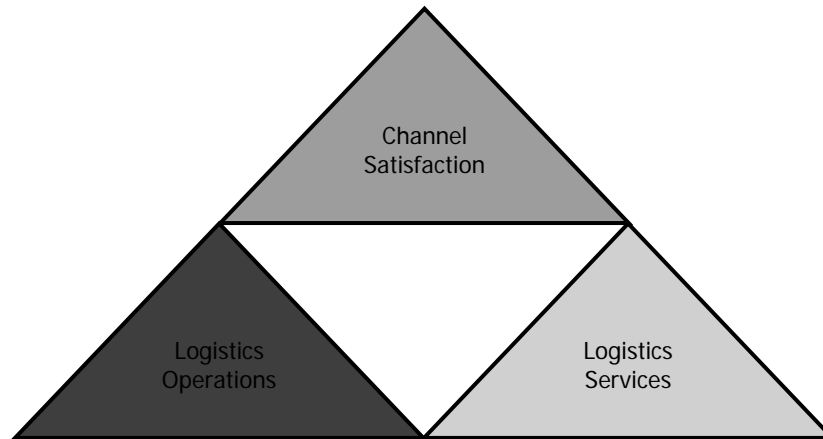
Source: *Keeping Score*, Univ. of Tenn., CLM.

Other Performance Guidelines

- The metrics must be consistent with overall corporate .
- The metrics must focus on and expectations.
- Prioritize your metrics.
- Focus upon not functions.
- Use a balanced approach in selecting and developing metrics.
- Precise cost measurement is an important aspect for gauging improvement.
- Use technology to enhance efficient performance measurement.



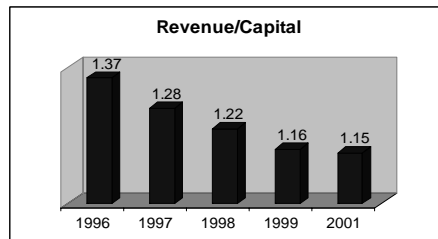
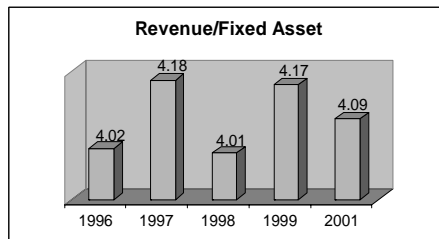
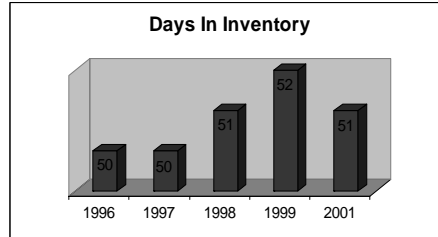
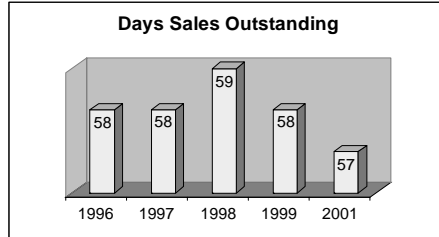
Logistics Quantification Pyramid



Types of Measures

- Time
 - On Time Delivery
 - Order Cycle Time (Variability)
 - Response Time
- Quality
 - Customer Satisfaction
 - Processing Accuracy
 - Perfect Order Fulfillment
 - On Time Delivery
 - Complete Order
 - Damage Free
 - Accurate Invoice
 - Forecast Accuracy
 - Schedule Adherence
- Cost
 - Inventory Turns
 - Cash-to-Cash Cycle Time
 - Total Landed Costs
 - Cost of Goods Sold
 - Transportation Costs
 - Inventory Carrying Costs
 - Material Handling Costs
 - Cost of Lost Sales
- Operational
 - Asset Utilization
 - Operating Ration
 - Product Availability

What Has Changed?



Source: Stephen Timme, FinListics Solutions

Measurement & Customer Service

Logistics Outputs That Influence Customer Service

- Product Availability
 - Order Cycle Time
 - Logistics Operations Responsiveness
 - Logistics Systems Information
 - Post Logistics Support
-

Measures You MUST Calculate

Already Know These

- Profitability
- Order Cycle Time
- Inventory Turn
- ICC
- COLS

New Measures

- Operating Ratio
- ROA
- Cash to Cash

Quick Review Follows

Review of Income Statement

FIGURE 15-3CBL Distributors.com Income Statement: 2001

	Symbol	(000)	(000)
Sales	S		\$150,000
Cost of goods sold	CGS		80,000
Gross margin	$GM = S - CGS$		70,000
Transportation	TC	\$6,000	
Warehousing	WC	1,500	
Inventory carrying	$IC = IN * W$	3,000	
Other operating cost	OOC	30,000	
Total operating cost	$TOC = TC + WC + IC + OOC$		40,500
Earnings before interest and tax	$EBIT = GM - TOC$		29,500
Interest	INT		12,000
Taxes	$TX = (EBIT - INT) * .4$		7,000
Net income	NI		\$10,500

Review of Balance Sheet

FIGURE 15–4 CBL Distributors.com Balance Sheet: December 31, 2001

Assets	Symbol	(000)
Cash	<i>CA</i>	\$15,000
Accounts receivable	<i>AR</i>	30,000
Inventory	<i>IN</i>	10,000
Total current assets	$TCA = CA + AR + IN$	55,000
Net fixed assets	<i>FA</i>	90,000
Total assets	$TA = FA + TCA$	\$145,000
Liabilities		
Current liabilities	<i>CL</i>	\$65,000
Long-term debt	<i>LTD</i>	35,000
Total debt	$TD = CL + LTD$	100,000
Stockholders equity	<i>SE</i>	45,000
Total liabilities and equity	$TLE = TD + SE$	\$145,000

SCM & COGS

SCM Activity	Cost of Goods Sold Items Examples
Procurement	<ul style="list-style-type: none"> •Price of purchased goods and services •Administrative expenses •Customs duties and taxes
Transportation Management	<ul style="list-style-type: none"> •Inbound-many times included in price of purchased goods •Outbound •Maintenance, depreciation and taxes •Administrative
Warehouse Management (All or part may show up in selling, general & administrative but trend is to move to cost of goods sold.)	<ul style="list-style-type: none"> •Labor •Utilities and taxes •Maintenance and depreciation •Administrative
Inventory Management	<p>Warehousing expenses listed above and if not included in warehousing also the following items inventory holding operating costs carrying charges</p> <ul style="list-style-type: none"> •Obsolescence •Pilferage •Damage •Insurance and taxes

SCM & COGS (Continued)

SCM Activity	Cost of Goods Sold Items Examples
Information Technology (All or part may show up in selling, general & administrative but trend is to move to cost of goods sold.)	<ul style="list-style-type: none"> •People costs •Hardware maintenance and depreciation •Software maintenance and amortization
Outsourcing costs	<ul style="list-style-type: none"> •Payments to parties like 3PL's to which all parts of the supply chain have been outsourced.
Administration (Often shows up in selling, general and administrative expense)	<ul style="list-style-type: none"> •People costs

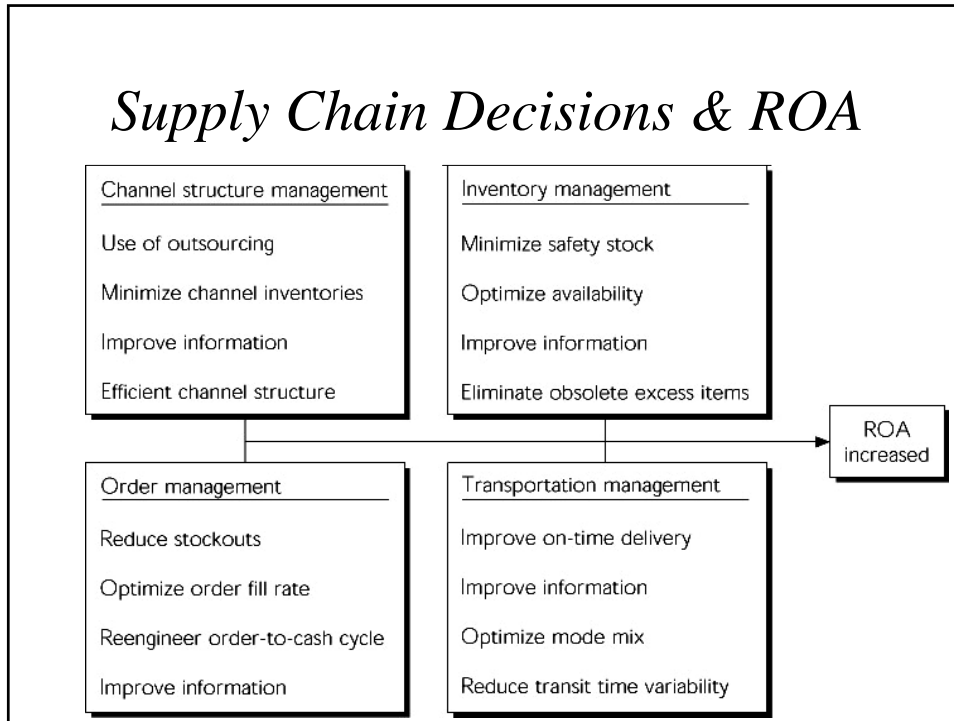
Source: Stephen Timme, FinListics Solutions

Other Metric Relationships

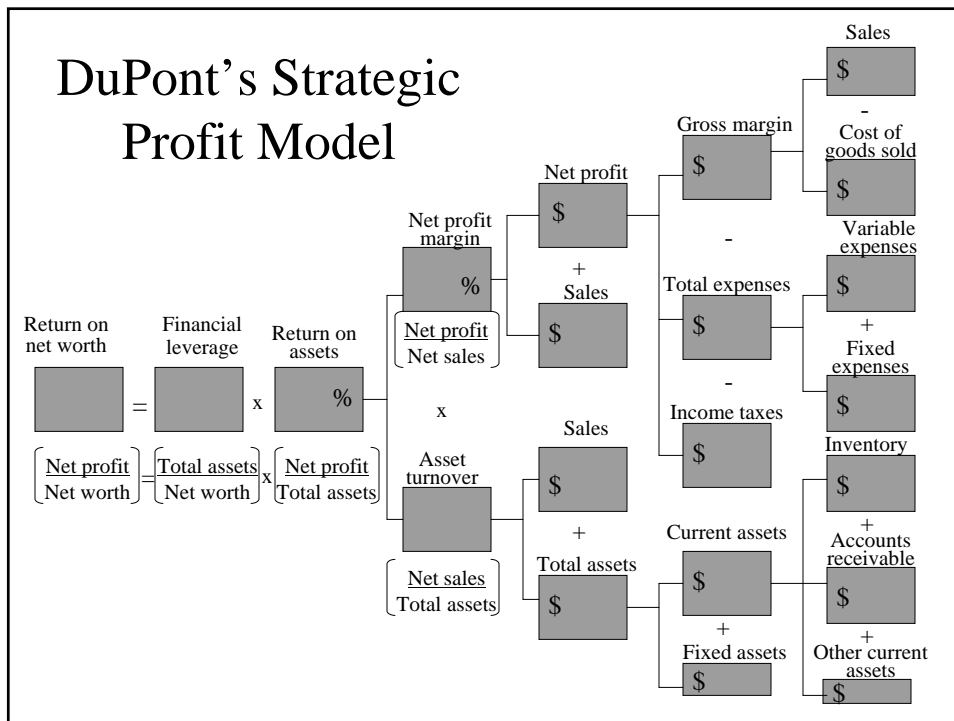
Financial Metrics	Logistics/Mkt Areas
Revenue Growth	<ul style="list-style-type: none"> •Acquisitions & Divestitures •Product/Service Mix •Price Changes
% Cost of Goods (Services) Sold And % Selling, General & Administrative	<ul style="list-style-type: none"> •Product/Service Mix •Pricing Strategy •Price Changes •Sales Channels •Outsourcing •Accounting Practices
Days Sales Outstanding	<ul style="list-style-type: none"> •Credit Terms •Discounts •Securitization & Factoring
Days In Inventory	<ul style="list-style-type: none"> •Product Mix •Vendor Managed Inventory •Sources of Procurement & Manufacturing •Service Levels
Days Purchases Outstanding	<ul style="list-style-type: none"> •Credit Terms •Discount Policy
Fixed Asset Utilization	<ul style="list-style-type: none"> •Age of Assets •Outsourcing

Source: Stephen Timme, FinListics Solutions

Supply Chain Decisions & ROA

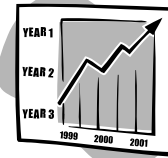


DuPont's Strategic Profit Model



Financial Impact of Supply Chain Decisions

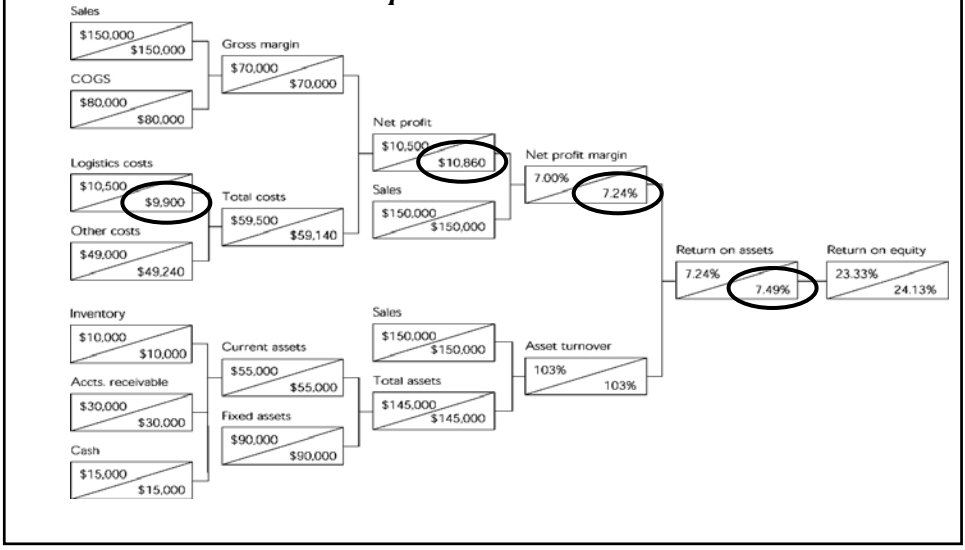
- Transportation cost reduction of 10% results in:
 - Net income increases by \$??
 - Profit margin increases to ?? %.
 - ROA increases to ?? %.
 - Transportation costs decrease to ?? % of sales.
 - No change in warehousing or inventory costs as a percentage of sales.
- See Next Slides



Financial Impact of a 10 Percent Reduction in Transportation Cost

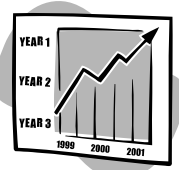
	Symbol	CBL, 2001 \$(000)	Transportation Cost Reduced 10 Percent
Sales	<i>S</i>	\$150,000	\$150,000
Cost of goods sold	<i>CGS</i>	80,000	80,000
Gross margin	$GM = S - CGS$	70,000	70,000
Transportation	<i>TC</i>	6,000	5,400
Warehousing	<i>WC</i>	1,500	1,500
Inventory carrying	$IC = IN * W$	3,000	3,000
Other operating cost	<i>OOC</i>	30,000	30,000
Total operating cost	<i>TOC</i>	40,500	39,900
Earnings before interest and tax	<i>EBIT</i>	29,500	30,100
Interest	<i>INT</i>	12,000	12,000
Taxes	<i>TX</i>	7,000	7,240
Net income	<i>NI</i>	10,500	10,860
Asset deployment			
Inventory	<i>IN</i>	10,000	10,000
Accounts receivable	<i>AR</i>	30,000	30,000
Cash	<i>CA</i>	15,000	15,000
Fixed assets	<i>FA</i>	90,000	90,000
Total assets	<i>TA</i>	\$145,000	\$145,000
Ratio analysis			
Profit margin	<i>NI/S</i>	7.00%	7.24%
Return on assets	<i>NI/TA</i>	7.24%	7.49%
Inventory turns/year	<i>CGS/IN</i>	8.00	8.00
Transportation as percentage of sales	<i>TC/S</i>	4.00%	3.60%
Warehousing as percentage of sales	<i>WC/S</i>	1.00%	1.00%
Inventory carrying as percentage of sales	<i>IC/S</i>	2.00%	2.00%

Strategic Profit Model for Reduced Transportation Costs



Financial Impact of Supply Chain Decisions

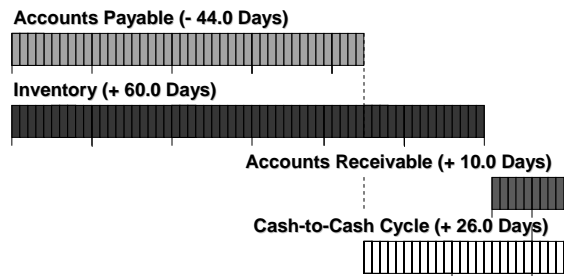
- Transportation cost reduction of 10% results in:
 - Net income increases by \$360,000.
 - Profit margin increases to 7.24%.
 - ROA increases to 7.49%.
 - Transportation costs decrease to 3.6% of sales.
 - No change in warehousing or inventory costs as a percentage of sales.
- This is an Easy Problem!!

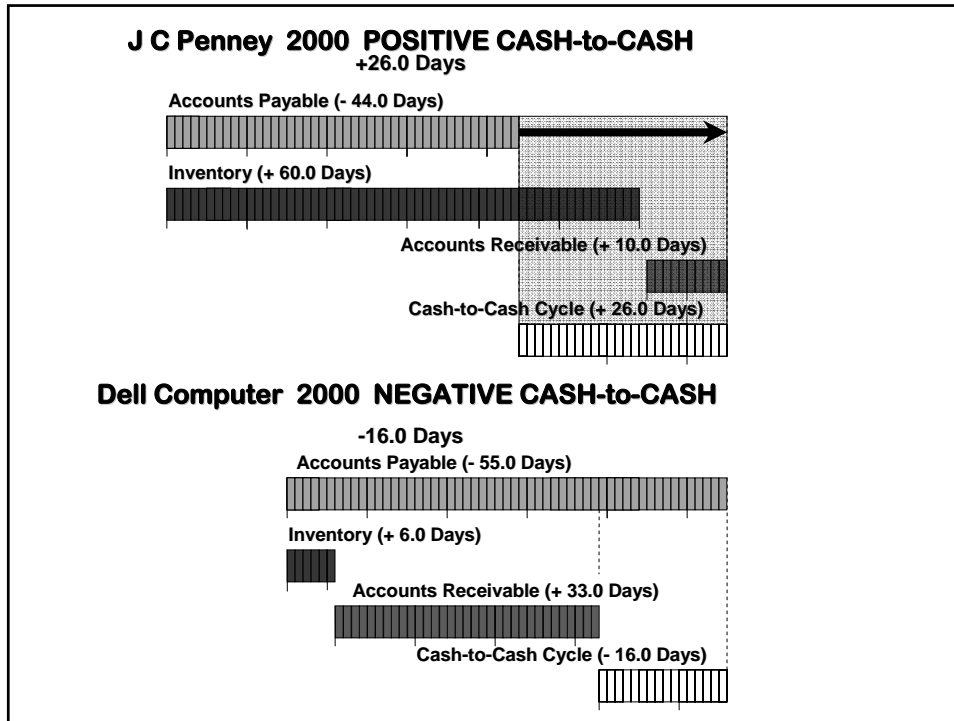


What Is Cash-to-Cash?

- (-) Accounts Payable** $\left[\frac{A/P * 365}{COGS} \right]$
- (+) Inventories** $\left[\frac{Inventory * 365}{COGS} \right]$
- (+) Accounts Receivable** $\left[\frac{A/R * 365}{Sales} \right]$
- (=) Cash-to-Cash Cycle**

J C Penney 2000 **POSITIVE CASH-to-CASH** +26.0 Days





Why is Cash-To-Cash an Important Metric?

- Data relatively easy to gather
- Accounting
 - Measure of liquidity
 - Measure of value
- Supply Chain Management
 - Bridges across inbound material activities with suppliers, through manufacturing operations, and the outbound sales activities with customers.

Johnson Manufacturing Consolidated Balance Sheets Year 2002 (Thousands)		Identify the Important Components from the Balance Sheet	
CURRENT ASSETS			
Cash and equivalents	\$ 76,373.00		
Accounts receivable	\$ 18,135.00	Receivables	\$18,135,000
Inventories	\$ 583,469.00	Inventories	\$583,469,000
Store supplies	\$ 42,103.00		
Other	\$ 91,273.00		
Total current assets	\$ 811,353.00		
Property and equipment, net	\$ 449,043.00		
Other assets	\$ 124,036.00		
Total assets	\$ 1,384,432.00		
LIABILITIES AND SHAREHOLDERS' EQUITY			
CURRENT LIABILITIES			
Accounts payable	\$ 102,446.00	Payables	\$102,446,000
Current portion of long-term debt	\$ 150,000.00		
Accrued expenses	\$ 241,673.00		
Payable to The Limited, Inc.	\$ 23,741.00		
Income taxes	\$ 168,286.00		
Total current liabilities	\$ 686,146.00		
Long-term debt	\$ 100,000.00		
Deferred income taxes	\$ 816.00		
Other long-term liabilities	\$ 52,739.00		
SHAREHOLDERS' EQUITY			
Common stock	\$ 2,659.00		
Paid-in capital	\$ 1,217,793.00		
Retained earnings (deficit)	\$ (113,067.00)		
Less: treasury stock, at average cost	\$ (562,654.00)		
Total shareholders' equity	\$ 544,731.00		
Total liabilities and shareholders' equity	\$ 1,384,432.00		

Income Statement	Dec 02
Revenue	36,298,000
Cost of Goods Sold	8,785,000

What Is J&J Cash-to-Cash?

(-) Accounts Payable $\left[\frac{\$102,446,000 * 365}{8,785,000,000} \right]$
(+) Inventories $\left[\frac{\$583,469,000 * 365}{8,785,000,000} \right]$
(+) Accounts Receivable $\left[\frac{\$18,135,000 * 365}{36,298,000,000} \right]$
(=) Cash-to-Cash Cycle

+ 20 days

What is Coke's Cash-to-Cash?



Income Statement	Dec 02
Revenue	1,246.6
COGS	668.4
Gross Profit	578.2

Balance Sheet	Dec 02
Assets	
Current Assets	
Cash	18.2
Net Receivables	109.5
Inventories	38.6
Other Current Assets	4.6
Total Current Assets	171.0
Net Fixed Assets	466.8
Other Noncurrent Assets	715.7
Total Assets	1,353.5
Liabilities and Shareholders' Equity	
Current Liabilities	
Accounts Payable	48.1
Short-Term Debt	4.0
Other Current Liabilities	103.8
Total Current Liabilities	155.9
Long-Term Debt	849.8
Other Noncurrent Liabilities	95.5
Total Liabilities	1,320.7

What Is Coke's Cash-to-Cash?

- (-) AP
- (+) Inv
- (+) AR
- (=) CTC



Leverage Points

- **Extend Average Accounts Payable**
- **Lower Average Inventory**
- **Reduce Average Accounts Receivable**

Extend Accounts Payable

- **Electronic payment at last possible minute.**
- **Partial rather than full payments to vendors.**
- **Reduce frequency of employee payroll (from weekly to monthly)**
- **Extend payments by utilizing interest-free credit cards or lines of credit.**
- **Delay sales commissions until accounts receivables are paid rather than at point of sale.**

Lower Average Inventory

- **Real-time inventory tracking**
- **CPFR (collaborative planning, forecasting, and replenishment)**
- **Synchronizing supply/demand planning**
- **Cross-docking**
- **Shift inventories in the supply chain**

Reduce Accounts Receivable

- **Companies with low days-sales-outstanding tend to follow up quickly on delinquent accounts.**
- **Assess interest on delinquent accounts**
- **Require full payment at time of order or require a large deposit.**
- **Pre-addressed, stamped envelopes**
- **Factoring**
- **Trade off A/R vs. A/P within the supply chain**

Operating Ratio

- Key Measure in the Trucking Industry

$$\frac{\text{operating expense}}{\text{operating revenue}} \times 100 = \text{Operating Ratio}$$

Consolidated Freightways 103.9 ← **Which is Better???**
 New Penn Motor Express 83.4



J.B. Hunt Operation Problem

Income Statement	Dec 02	Dec 01	Dec 00
Revenue	2,247.90	2,100.30	2,160.40
Cost of Goods Sold	1,039.80	976.2	1,068.50
Gross Profit	1,208.10	1,124.10	1,091.90
Gross Profit Margin	53.70%	53.50%	50.50%
SG&A Expense	928.3	876.2	861.5
Dep. & Amortization	146	143	134.4
Operating Income	101	72.3	63.4
Operating Margin	4.50%	3.40%	2.90%
Nonoperating Income	-1.4	-2.1	4.8
Nonoperating Exp.	57.6	59.6	58.3
Income Before Taxes	74.8	43.2	42.5
Income Taxes	23	10.1	6.4
NI After Taxes	51.8	33.1	36.1

Conclusions

- More and More Financial Measures are being used throughout Logistics & Trans.
- Most Companies & Industries have specific measures that you will need to use
- Everyone speaks the basic metrics
- Metrics are the tools to measure performance: company and personal!!!!

**“If you don’t
have a goal,
any road will
get you there.”**

Yogi Berra

