FINANCIAL MANAGEMENT

Instructor: Ummu Salma Al-Azizah

Required text

- Fundamental of Financial Management
- Eugene Brigham, 11th edition

The Role Of Financial Management

- What is Financial Management?
- The Goal of the Firm
- Corporate Governance
- Organization of the Financial Management Function

What is Financial Management?

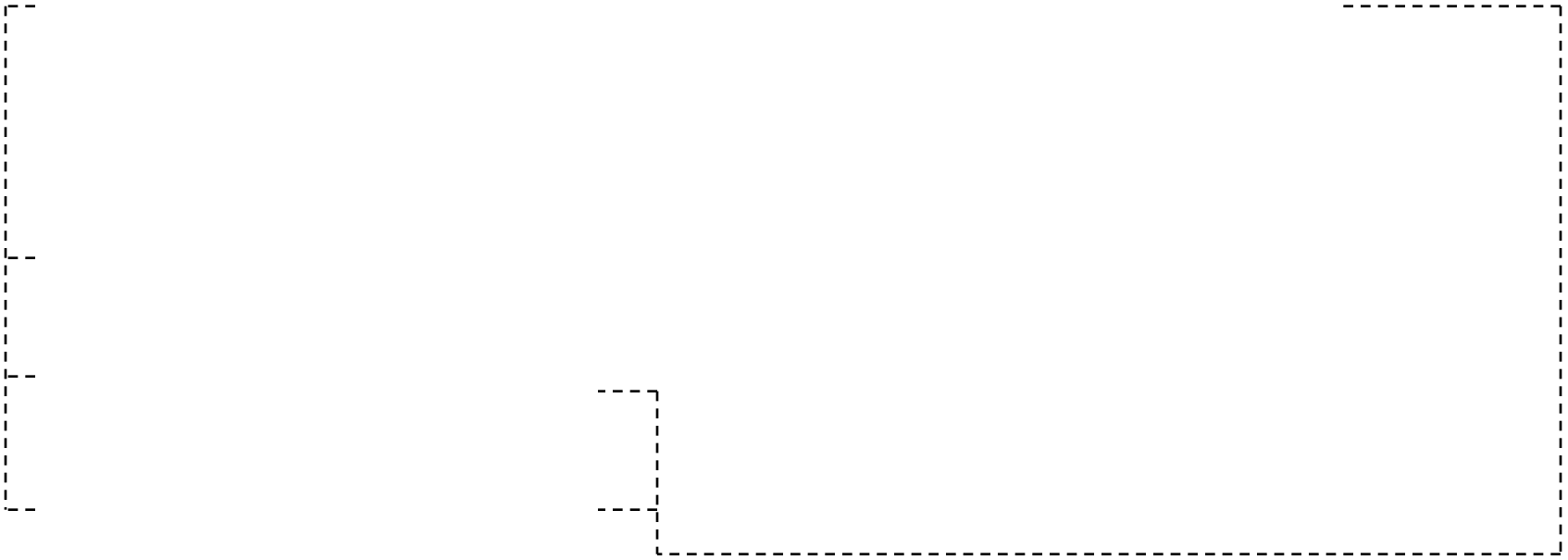
- Financial manager: how to raise funds, manage their firms cash position.
- FM: manufacturing and service firms
- Knowledge needed:

1. Determining the value of projects, assessing financing needs
2. General knowledge of business administration

Career Opportunities

- Every career need to know about: budgeting, financing and investment
- Non finance major: implication in all business decisions
- Need to manage personal investments

Role of Finance in a Typical Business Organization



Decision Functions of Financial Management

1. Investment decisions
- Optimal firm size
- All about asset
- Expanded product

2. Financing decisions
- Best type of financing
- Best dividend policy
- How to acquire fund

3. Asset management decisions
- How to manage asset
- How to emphasis on current asset management

Modern Corporation

1. Shareholders: principals
2. Management: agent; stock options, bonuses and payment

Problem between principals and agent: agency problem.

Agency theory: bagian dari ilmu ekonomi yang berkaitan dengan perilaku pemilik modal dan manajer.

Form of Business Organization

1. Proprietorship, bisnis yang dimiliki oleh individu
2. Partnership, 2 atau lebih kepemilikan
3. Corporation, legal ownership.

Social Responsibility of Organization

Such as:

1. Menjaga konsumen
2. Bersikap adil terhadap pegawai
3. Fair dalam melakukan penyaringan kerja dan menjaga keamanan lingkungan kerja
4. Memberikan pendidikan
5. Menjaga lingkungan sekitar (water and air)
6. Menjaga stakeholders (creditors, employees, customers, suppliers, communities and others)

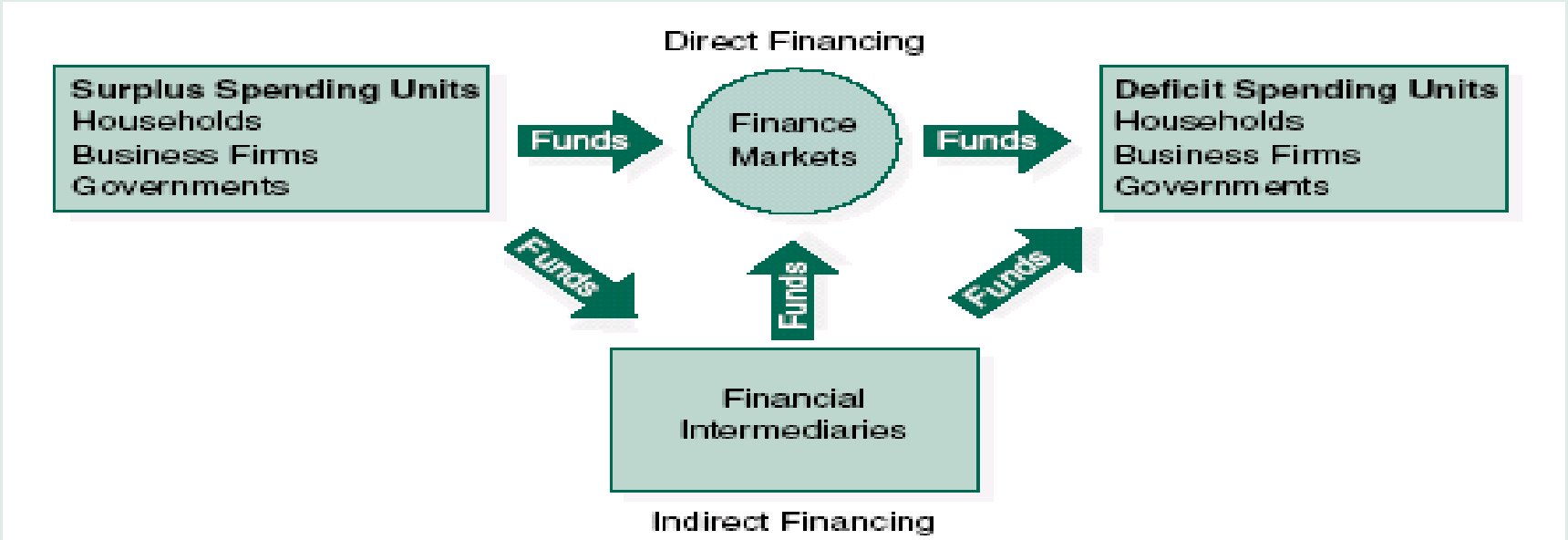
Financial Markets and Institutions

- Banks, insurance companies, rating agencies, regulatory bodies
- Knowledge is needed:

1. Effect of changes in interest rates, regulations, financial instruments
2. All about business administration

Transfer of Funds on Financial Market

EXHIBIT 1.1
Transfer of Funds from Surplus to Deficit Spending Units



The role of the financial system—financial institutions and markets—is to facilitate the flow and efficient allocation of funds throughout the economy. The greater the flow of funds, the greater the accommodation of individuals' preferences for spending and saving. An efficient and sound financial system is a necessary condition to having a highly advanced economy like the one in the United States.

Investments

- Brokerage firms, banks, mutual funds, insurance companies
- Knowledge is needed:

1. Pricing of assets (stocks, bonds etc)
2. General knowledge about business administrations

Financial Manager's Responsibilities

- Forecasting and planning
- Investment and financing decision
- Coordination and control
- Dealing with financial markets

Financial Goals of the Corporation

- The primary financial goal is shareholder wealth maximization which translates into maximizing stock price.

How to Maximize Shareholder Wealth

- Maximizing Earnings per share rather than total profit
- Example:

Before	After
Net income = $1200	$1500
Total Shares = 300	Sold 300 more shares
Earning Per Share =?	EPS = $2.50

Continue….

- Timing of the earnings

  a Rupiah in hand now is worth more than a rupiah coming in future
- Some projects may have high returns but might be very risky

  Should the firm take on project?

- How should projects be financed?

1. Use more debt?
2. Use of debt increases riskiness of projected future earnings?

- Dividend Policy Decision

  Should firm pay out earnings as dividends or plow them back into the firm?

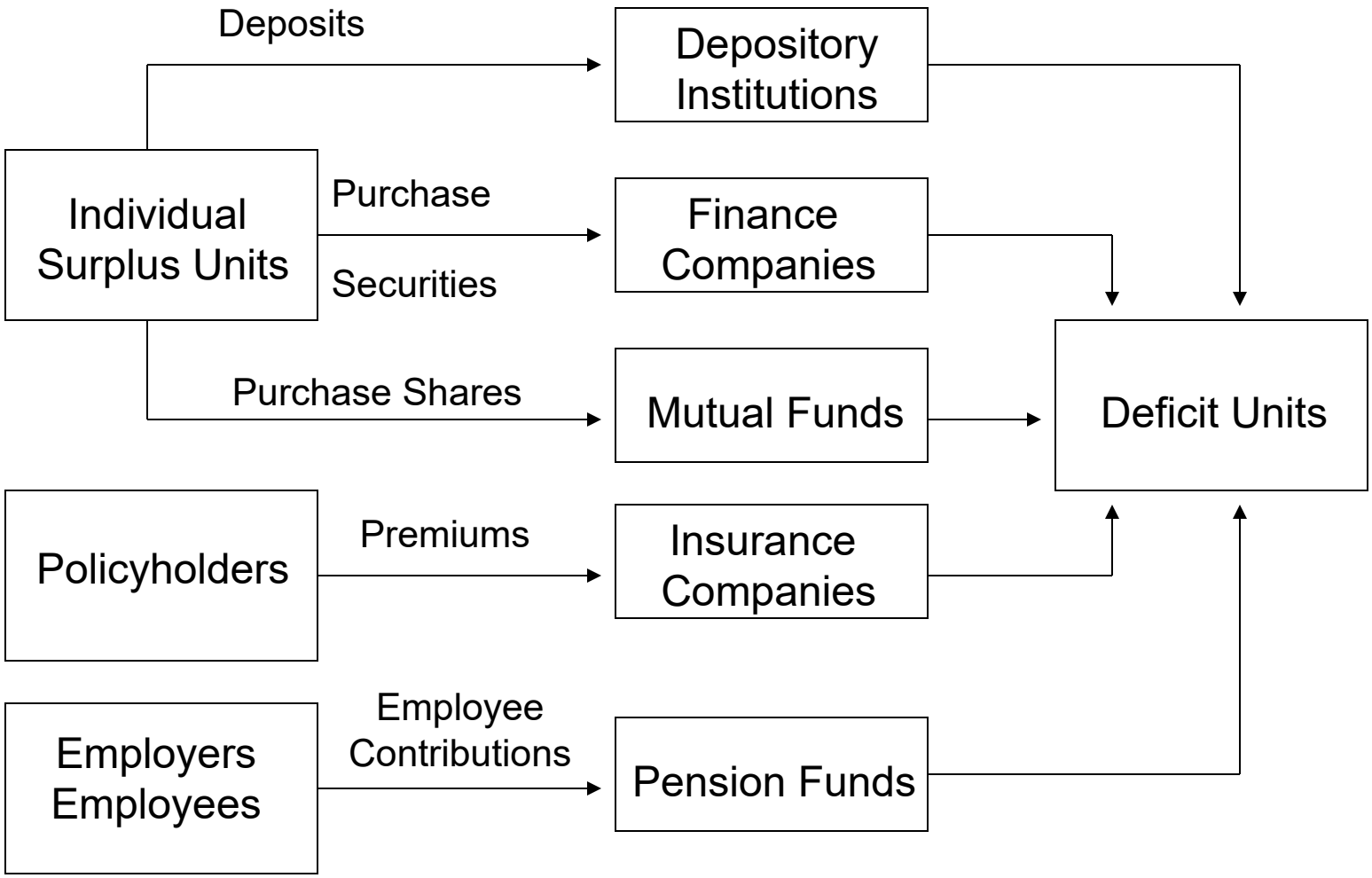
Other Goals of a Corporation

- Be Socially responsible
- Keep stockholder returns as a “reasonable” level.

Global Financial Markets

- Global Integration.
- Barriers to Global Integration.
- Financial Markets Integration within Europe.
- Role of the Foreign Exchange Market.

Comparison of Roles among Financial Institutions



END OF CHAPTER

TIME VALUE OF MONEY

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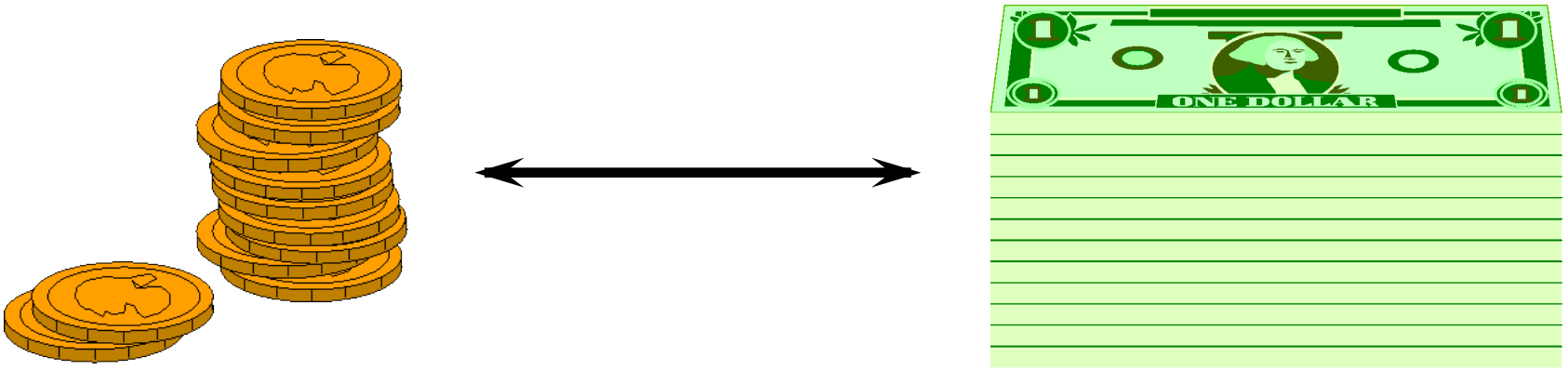
Topics Covered

- Future Values
- Present Values
- Multiple Cash Flows
- Perpetuities and Annuities
- Effective Annual Interest Rate
- Inflation & Time Value

The Time Value of Money

Compounding and Discounting Single Sums



Future Values

Future Value – Jumlah yang akan diperoleh dari nilai investasi saat ini.

Compound Interest - Interest earned on interest.

Simple Interest - Interest earned only on the original investment.

Future Values

Example - Simple Interest

Interest earned at a rate of 6% for three years on a principal balance of $100.

	Today	Future Years		
		1	2	3
Interest Earned		6	6	6
Value	100	106	112	118

Value at the end of Year 3 = $118

Future Values

Example - Compound Interest

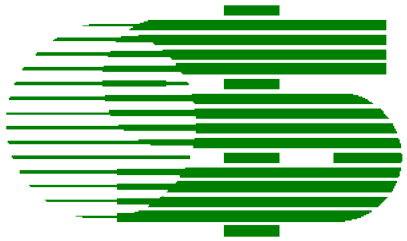
Interest earned at a rate of 6% for three years on the previous year's balance.

	Today	*Future Years*		
		1	*2*	*3*
Interest Earned		6.00	6.36	6.74
Value	100	106.00	112.36	119.10

- **Future Value of $100 compounded at 6% for three years = $119.10**

Future Values

$$FV = \$100 \times (1+r)^t$$

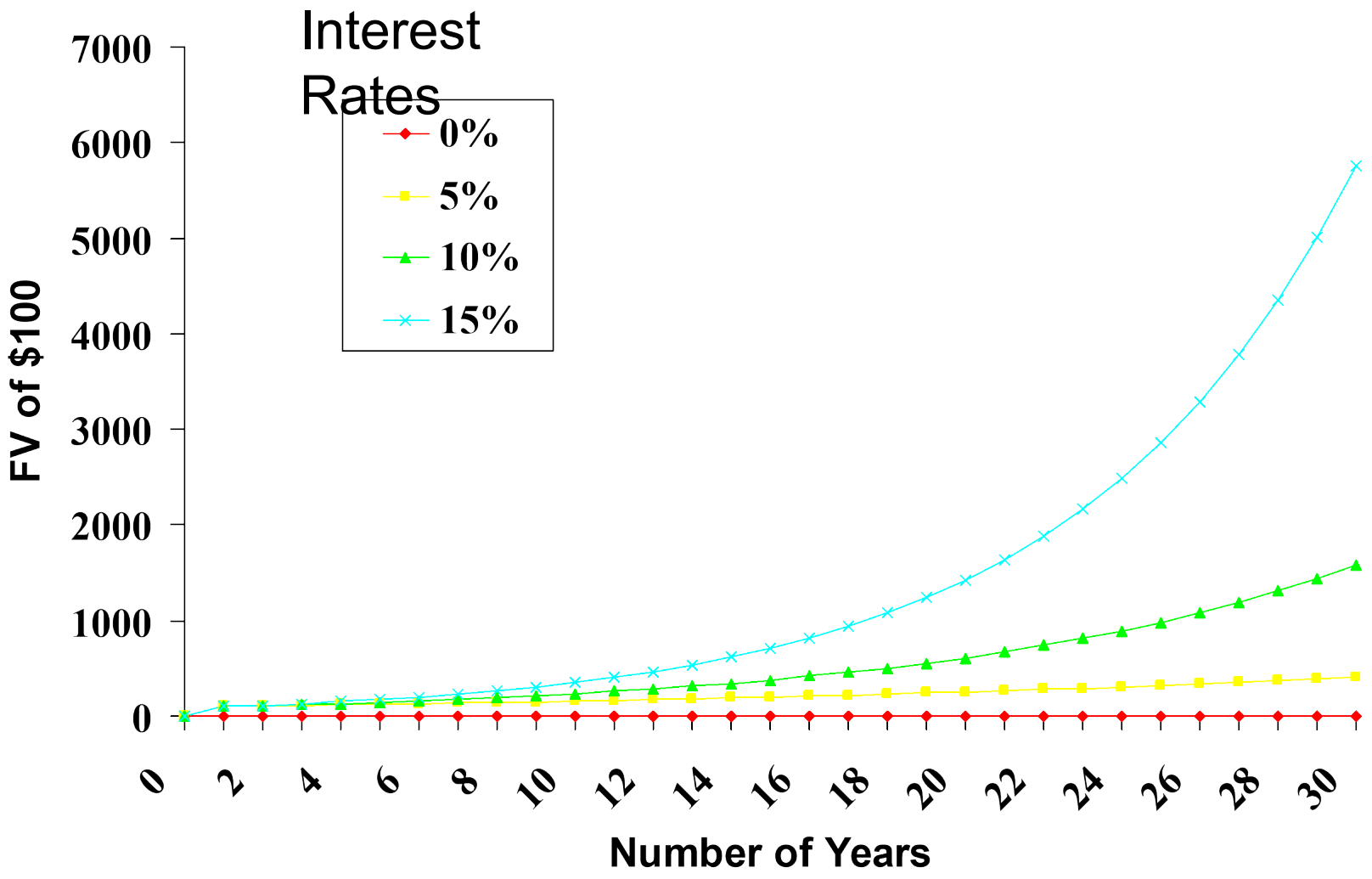


Example - FV

What is the future value of $100 if interest is compounded annually at a rate of 6% for three years?

$$FV = \$100 \times (1+.06)^3 = \$119.10$$

Future Values with Compounding



Present Values

Present Value

Value today of a future cash flow.

Discount Factor

Present value of a $1 future payment.

Discount Rate

Interest rate used to compute present values of future cash flows.

Present Values

$$\text{Present Value} = \text{PV}$$

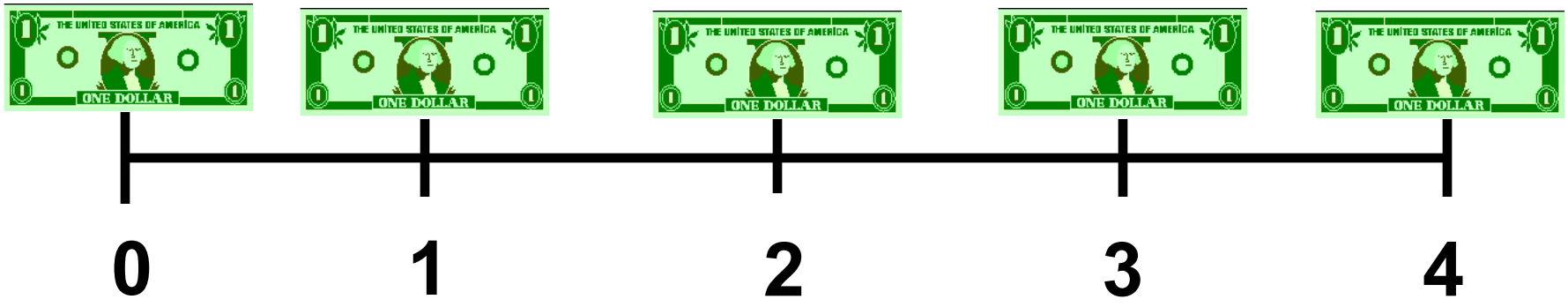
$$\text{PV} = \frac{\text{Future Value after t periods}}{(1+r)^t}$$

Important Time Value Relationships

- Increasing interest rate and time **increases** future value. POSITIVE RELATIONSHIP.
- Increasing interest rate and time **decreases** present value. INVERSE RELATIONSHIP.

The Time Value of Money

Compounding and Discounting Cash Flow Streams



Perpetuities

- Suppose you will receive a fixed payment every period (month, year, etc.) forever. This is an example of a perpetuity.

$$PV = \frac{C}{r}$$

Perpetuities & Annuities

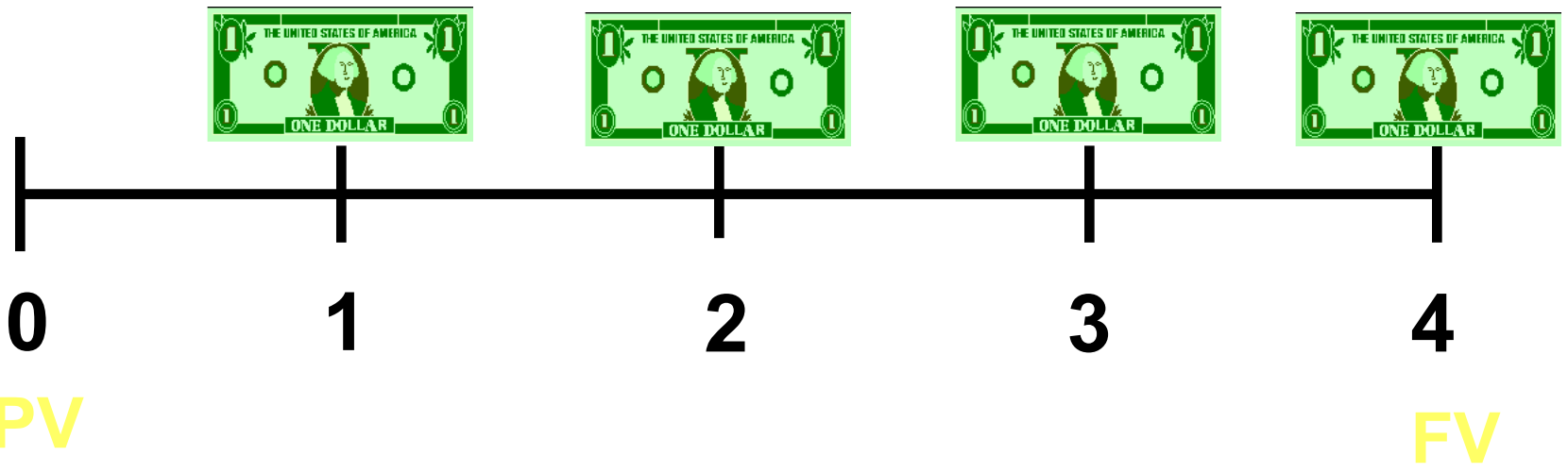
Example - Perpetuity

You want to create an endowment to fund a football scholarship, which pays $15,000 per year, forever, how much money must be set aside today in the rate of interest is 5%?

$$PV = \frac{15{,}000}{.05} = \$300{,}000$$

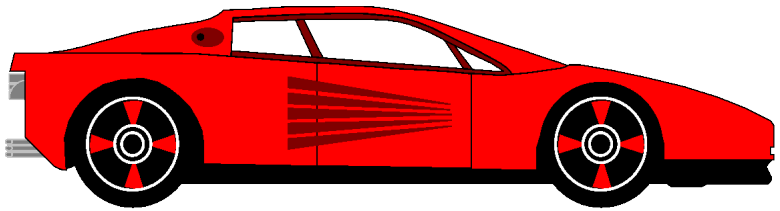
Annuities

- **Annuity**: a sequence of equal cash flows, occurring at the end of each period. This is known as an ordinary annuity.



Examples of Ordinary Annuities:

- If you buy a bond, you will receive equal semi-annual coupon interest payments over the life of the bond.
- If you borrow money to buy a house or a car, you will pay a stream of equal payments.



Perpetuities & Annuities

PV of Ordinary Annuity Formula

$$PV = C\left[\frac{1}{r} - \frac{1}{r(1+r)^t}\right]$$

C = cash payment

r = interest rate

t = Number of years cash payment is received

Perpetuities & Annuities

Applications

- Value of payments
- Implied interest rate for an annuity
- Calculation of periodic payments
  - Mortgage payment
  - Annual income from an investment payout
  - Future Value of annual payments

$$FV = \left[C \times PVAF\right] \times (1+r)^t$$

Effective Interest Rates

example

Given a monthly rate of 1%, what is the Effective Annual Rate(EAR)? What is the Annual Percentage Rate (APR)?

$$EAR = (1 + .01)^{12} - 1 = r$$

$$EAR = (1 + .01)^{12} - 1 = .1268 \text{ or } 12.68\%$$

$$APR = .01 \times 12 = .12 \text{ or } 12.00\%$$

Inflation

Inflation - Rate at which prices as a whole are increasing.

Nominal Interest Rate - Rate at which money invested grows.

Real Interest Rate - Rate at which the purchasing power of an investment increases.

Inflation

Example

If the interest rate on one year govt. bonds is 5.0% and the inflation rate is 2.2%, what is the real interest rate?

$$1 + \text{real interest rate} = \frac{1+.050}{1+.022}$$

$$1 + \text{real interest rate} = 1.027$$

$$\text{real interest rate} = .027 \text{ or } 2.7\%$$

$$\text{Approximation} = .050 - .022 = .028 \text{ or } 2.8\%$$

Example: Real retirement income

- Going back to your retirement in 43 years, you expect 3% inflation along with your 9% nominal investment rate annually and want to withdraw $32,000 in real terms at the beginning of each year for 20 years once you retire.
- How will this change your retirement saving plans?

END OF CHAPTER

FINANCIAL STATEMENT, CASH FLOWS

Instructor: Ummu Salma Al-Azizah

Chapter Objectives

- Identify the way of financial statement report.
- Calculate and interpret key financial ratios.
- Understand the use of financial information.
- Understand all about financial ratios.
- Understand Du Pont identity for comparative purposes

Annual Report

- Balance sheet: gambaran posisi keuangan perusahaan pada waktu tertentu.
- Income statement: ringkasan pendapatan dan pengeluaran perusahaan dalam satu periode waktu.
- Statement of retained earnings: menggambarkan seberapa laba yang ditahan oleh perusahaan, daripada nilai laba yang dibagikan kepada shareholder.
- Statement of cash flows: melaporkan kegiatan perusahaan dalam penggunaan arus kas.

Balance sheet

Assets	Liabilities
Cash	Account Payable
Account Receivable	Notes Payable
Inventories	Accruals
Total CA	Total CL
Gross Fixed Assets	Long term debt
Less: Depreciation	Common stock
Net FA	Retained earnings
Total Assets	Total Equity Total L & E

Income Statement

- Ringkasan dari pendapatan dan pengeluaran perusahaan.
- Menggambarkan performance selama periode tertentu.
- Income statements dapat meng-cover setiap periode pencatatan, akan tetapi biasanya dibuat dalam monthly period, per 3 bulanan atau tahunan.

Income statement

	2002	2001
Sales	6,034,000	3,432,000
COGS	5,528,000	2,864,000
Other expenses	519,988	358,672
EBITDA	(13,988)	209,328
Depreciation & Amortization	116,960	18,900
EBIT	(130,948)	190,428
Interest expense	136,012	43,828
EBT	(266,960)	146,600
Taxes	(106,784)	58,640
Net Income	(160,176)	87,960

Other data

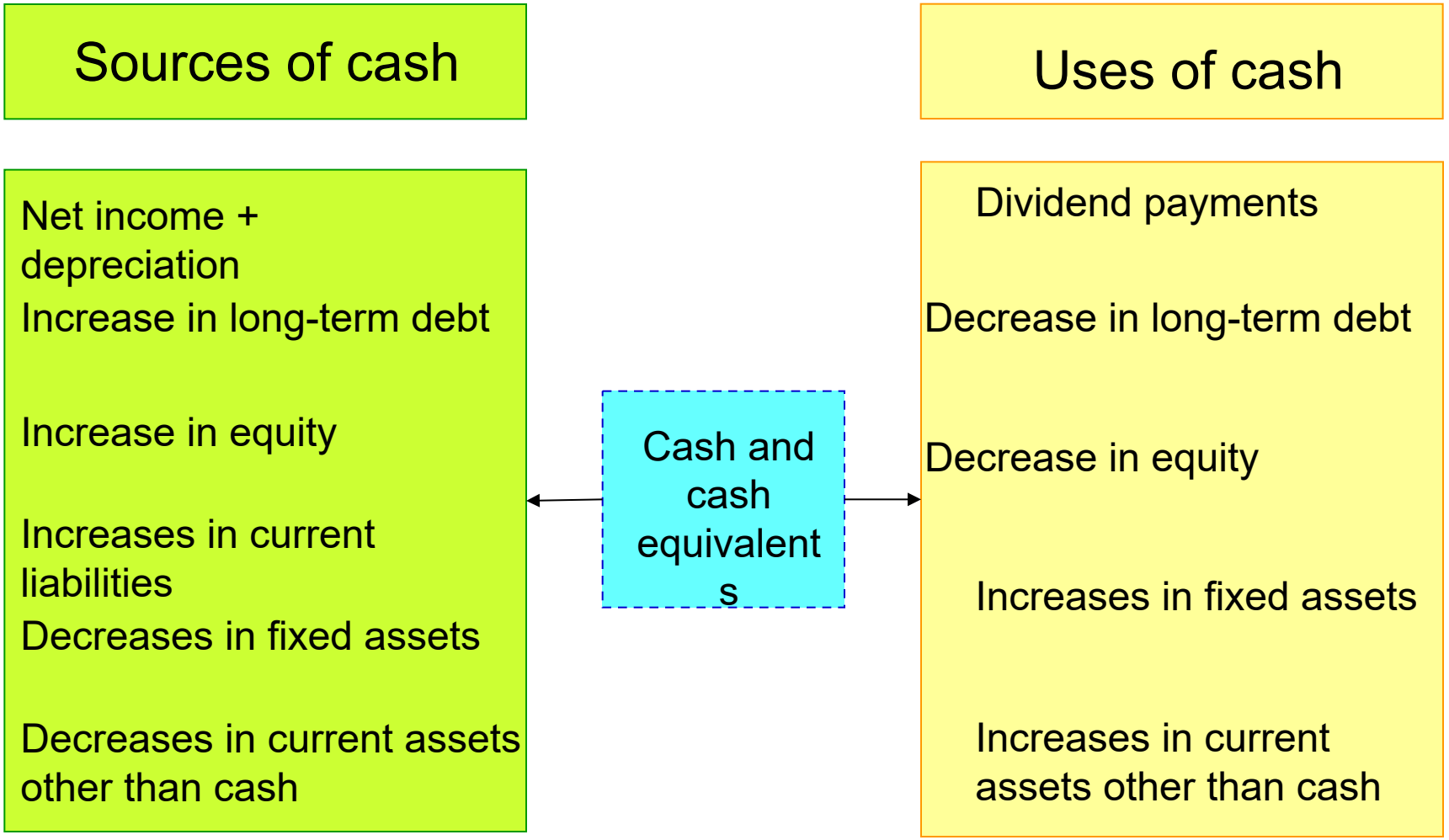
	2002	2001
Number of shares	100,000	100,000
EPS	-$1.602	$0.88
DPS	$0.11	$0.22
Stock Price	$2.25	$8.50
Lease payments	$40,000	$40,000

Statement of Retained Earnings (2002)

Balance of retained earnings, 12/31/01	**$203,768**
Add: net income, 2002	(160,176)
Less: dividend paid	(11,0000
Balance of retained earnings, 12/31/02	$32,592

Cash

- Cash: diperoleh dari penjualan barang dan jasa, aset atau surat berharga.
- Cash: digunakan untuk membayar material produksi dan pekerja untuk memproduksi barang atau jasa serta dengan pembelian berbagai aset.
- Cash flow from asset = cash flow to debtholders + cash flow to shareholders.


Sources of cash
Uses of cash
Net income + depreciation
Increase in long-term debt
Increase in equity
Increases in current liabilities
Decreases in fixed assets
Decreases in current assets other than cash
Cash and cash equivalents
Dividend payments
Decrease in long-term debt
Decrease in equity
Increases in fixed assets
Increases in current assets other than cash

Statement of Cash Flows

- A statement that summarizes the sources and uses of cash.
- Changes are divided into three main categories:
  - Operating activities—includes net profit and changes in most current accounts
  - Investment activities—includes changes in fixed assets
  - Financing activities—includes changes in notes payable, long-term debt and equity accounts as well as dividends.

Statement of Cash Flows

- Operating activities
  - + Net profit
  - + Depreciation
  - + Any decrease in current assets (except cash)
  - + Increase in accounts payable
  - – Any increase in current assets (except cash)
  - – Decrease in accounts payable
- Investment activities
  - + Ending fixed assets
  - – Beginning fixed assets
  - + Depreciation

Statement of Cash Flows

- Financing activities
  - – Decrease in notes payable
  - + Increase in notes payable
  - – Decrease in long-term debt
  - + Increase in long-term debt
  - + Increase in ordinary shares
  - – Dividends paid

Statement of Cash Flows (2002)

OPERATING ACTIVITIES	
Net income	(160,176)
Add (Sources of cash):	
Depreciation	116,960
Increase in A/P	378,560
Increase in accruals	353,600
Subtract (Uses of cash):	
Increase in A/R	(280,960)
Increase in inventories	(572,160)
Net cash provided by ops.	(164,176)

Statement of Cash Flows (2002)

L-T INVESTING ACTIVITIES	
Investment in fixed assets	(711,950)
FINANCING ACTIVITIES	
Increase in notes payable	436,808
Increase in long-term debt	400,000
Payment of cash dividend	(11,000)
Net cash from financing	825,808
NET CHANGE IN CASH	(50,318)
Plus: Cash at beginning of year	57,600
Cash at end of year	7,282

Conclusion

- Net cash from operations = -$164,176
- Perusahaan meminjam $825,000 untuk memenuhi kas-nya.
- Kas tetap turun sebesar $50,318 walaupun sudah dilakukan pinjaman.

Modifikasi data akuntansi untuk keputusan manajemen

- Kategori aset:

1. Operating assets; aset yang digunakan untuk operasional perusahaan.
2. Non-operating assets; kas dan investasi jangka pendek.
3. Operating current assets; cash, accounts receivable, inventory.
4. Long-term operating assets; plant and equipment

Operating Current Liabilities

- Hal yang terjadi sebagai konsekuensi alami dari operasional perusahaan
- Contoh: accounts payable dan accruals
- Tidak masuk dalam pencatatan notes payable atau hutang jangka pendek lainnya yang dikenakan suku bunga.

Net Operating Working Capital

- Selisih antara operating current assets dan operating current liabilities
- NOWC = (cash+account receivable+inventories) – (accounts payable+accruals)
- NOWC = Current assets – current liabilities
- NOWC 2002 = (7,282 + 632,160 + 1,287,360) – (524,160 + 489,600) = $913,042
- NOWC 2001 = $842,200

Operating Capital

- Operating capital = total net operating capital = net operating assets
- Sebagai total dari capital yang diperlukan untuk operasional bisnis
- OC = NOWC + Net Fixed Assets
- OC 2002 = 913,042 + 939,790 = $1,852,832
- OC 2001 = $1,187,200

Net Operating Profit After Taxes (NOPAT)

NOPAT = EBIT (1-Tax rate)

- Profit after tax perusahaan jika tanpa ada hutang dan investasi pada non operating assets
- Tidak terdapat dalam keputusan keuangan, sebagai better measurement dari operating performance untuk net income.
- NOPAT 2002 = ?
- NOPAT 2001 = ?

What is your assessment of the expansion's effect on operations?

	2002	2001
Sales	$6,034,000	$3,432,000
NOPAT	-$78,569	$114,257
NOWC	$913,042	$842,400
Operating capital	$1,852,832	$1,187,200
Net Income	-$160,176	$87,960

What effect did the expansion have on net cash flow and operating cash flow?

NCF_{02} = NI + Dep = ($160,176) + $116,960

= -$43,216

NCF_{01} = $87,960 + $18,900 = $106,860

OCF_{02} = NOPAT + Dep

= ($78,569) + $116,960

= $38,391

OCF_{01} = $114,257 + $18,900

= $133,157

Free Cash Flow (FCF)

- Sejumlah nilai dari arus kas yang tersisa terhadap penggunaan perusahaan dalam melakukan investasi aset yang digunakan sebagai penunjang operasional.
- FCF digunakan untuk di distribusikan kepada investors.
- FCF = OCF – Gross capital investment
- FCF = (NOPAT + Dep) - (Net Investment + depreciation)
- FCF = NOPAT – Net Investment in Operating Capital

What was the free cash flow (FCF) for 2002?

FCF_{02} = NOPAT – Net investment in oper. capital

= -$78,569 – ($1,852,832 - $1,187,200)

= -$744,201

Is negative free cash flow always a bad sign?

Economic Value Added (EVA)

- Perkiraan terhadap value creation yang dibuat oleh manajemen pada tahun tersebut.
- Berbeda dengan profit dalam akuntansi
- EVA = after tax operating income – after tax capital costs
- EVA = funds available to investors – cost of capital used
- EVA = NOPAT – After tax cost of capital
- EVA = EBIT (1-Tax rate) – (total net operating capital x WACC)

What is the firm's EVA? Assume the firm's after-tax percentage cost of capital was 10% in 2000 and 13% in 2001.

EVA_{02} = NOPAT – (A-T cost of capital) (Total Net Op. Cap.)

= -$78,569 – (0.13)($1,852,832)

= -$78,569 - $240,868

= -$319,437

EVA_{01} = $114,257 – (0.10)($1,187,200)

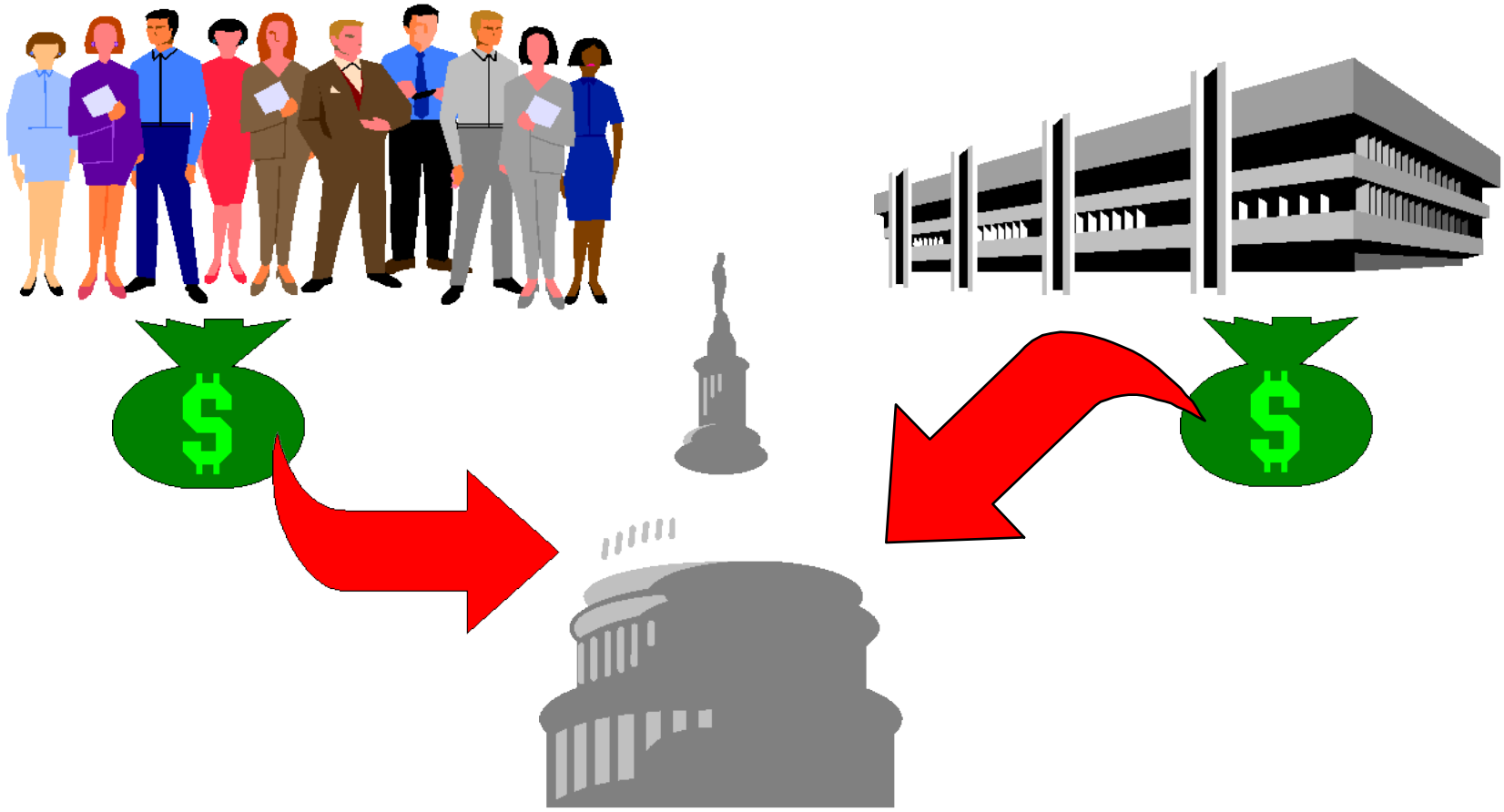
= $114,257 - $118,720

= -$4,463

Market Value Added (MVA)

- MVA = Market value of equity – Equity capital supplied by shareholders
- MVA = (shares outstanding x stock price) – Total common equity

Federal Income Tax System



Corporate and Personal Taxes

- High income = high marginal tax rate
- Corporation

  15% - 35% dengan income above $10 million.

  state tax 5%.
- Individuals

  10% - 38.6% dengan income above $307,050.

  state tax.

Tax Treatment

- Interest paid: pengurangan pajak bagi perusahaan.
- Interest earned: terkena pajak penuh.
- Dividend paid: dibayarkan setelah dikenakan pajak.
- Dividend received: dikenakan pajak karena dianggap sebagai pendapatan tambahan bagi individu.
- Tax loss carry back and carry forward
- Capital gains: for individual: taxed

END OF CHAPTER

ANALYSIS OF FINANCIAL STATEMENT

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Standardized Financial Statements

- Common size balance sheet

  menghitung seluruh accounts sebagai persentase dari total assets.
- Common size income statements

  menghitung seluruh item sebagai ppersentase dari penjualan.
- Mudah dilakukan sebagai pembanding laporan keuangan, terutama bagi perusahaan baru.
- Digunakan sebagai pembanding dengan perusahaan yang lebih besar, terutama di industri yang sama.

Balance Sheet: Assets

	2003E	2002
Cash	85,632	7,282
A/R	878,000	632,160
Inventories	1,716,480	1,287,360
Total CA	2,680,112	1,926,802
Gross FA	1,197,160	1,202,950
Less: Dep.	380,120	263,160
Net FA	817,040	939,790
Total Assets	3,497,152	2,866,592

Balance sheet: Liabilities and Equity

	2003E	2002
Accts payable	436,800	524,160
Notes payable	300,000	636,808
Accruals	408,000	489,600
Total CL	1,144,800	1,650,568
Long-term debt	400,000	723,432
Common stock	1,721,176	460,000
Retained earnings	231,176	32,592
Total Equity	1,952,352	492,592
Total L & E	3,497,152	2,866,592

Income statement

	2003E	2002
Sales	7,035,600	6,034,000
COGS	5,875,992	5,528,000
Other expenses	550,000	519,988
EBITDA	609,608	(13,988)
Depr. & Amort.	116,960	116,960
EBIT	492,648	(130,948)
Interest Exp.	70,008	136,012
EBT	422,640	(266,960)
Taxes	169,056	(106,784)
Net income	253,584	(160,176)

Other data

	2003E	2002
No. of shares	250,000	100,000
EPS	$1.014	-$1.602
DPS	$0.220	$0.110
Stock price	$12.17	$2.25
Lease pmts	$40,000	$40,000

Ratio Analysis

- Financial ratio: hubungan yang terjadi dari laporan keuangan perusahaan.
- Digunakan untuk membandingkan dan menginvestigasi hubungan antara perbedaan informasi keuangan, antara laporan yang satu dengan yang lain atau antara perusahaan.

Categories of Financial Ratios

- Liquidity: short term solvency (kemampuan perusahaan membayar hutang).
- Capital structure: menghitung kemampuan perusahaan untuk memenuhi hutang jaangka panjang (financial leverage).
- Asset management (turnover): menghitung efisiensi aset yang digunakan untuk menghasilkan penjualan.
- Profitability: kemampuan perusahaan untuk menilai pengeluaran.
- Market value: per share ratio.

Liquidity Ratios

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities} - \text{Bank overdraft}}$$

- Current ratio = current assets/ current liabilities
- CR = $2,680/ $1,145
  = 2.34x

Capital Structure Ratios

$$\text{Net debt/equity ratio} = \frac{\text{Total financial debt} - \text{Cash}}{\text{Total equity} - \text{Intangibles}}$$

$$\text{Debt/equity ratio} = \frac{\text{Total debt}}{\text{Total equity}}$$

$$\text{Equity multiplier} = \frac{\text{Total assets}}{\text{Total equity}}$$

$$\text{Net interest cover} = \frac{\text{EBIT}}{\text{Interest} + \text{finance charges}}$$

$$\text{Debt to gross cash flow} = \frac{\text{Interest-bearing debt}}{\text{Net profit after tax} + \text{depreciation} + \text{amortisation}}$$

Turnover Ratios

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventory}}$$

$$\text{Days' sales in inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}}$$

$$\text{Receivable s turnover} = \frac{\text{Sales}}{\text{Accounts receivable}}$$

Turnover Ratios (*continued*)

$$\text{Days' sales in receivables} = \frac{365 \text{ days}}{\text{Receivables turnover}}$$

$$\text{Fixed asset turnover} = \frac{\text{Sales}}{\text{Non-current assets}}$$

$$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Total assets}}$$

Profitability Ratios

$$\text{Profit margin} = \frac{\text{Net profit}}{\text{Sales}}$$

$$\text{Return on assets (ROA)} = \frac{\text{Net profit}}{\text{Total assets}} \times 100\%$$

$$\text{Return on investment} = \frac{\text{EBIT}}{\text{Total assets}} \times 100\,\%$$

$$\text{Return on equity (ROE)} = \frac{\text{Net profit}}{\text{Total equity}} \times 100\,\%$$

Market Value Ratios

$$\text{Price/earn ing ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

$$\text{Market - to - book ratio} = \frac{\text{Market val ue per share}}{\text{Book value per share}}$$

The Du Pont Identity

- Breaks ROE into three parts:
  - operating efficiency
  - asset use efficiency
  - financial leverage

$$\text{ROE} = \frac{\text{Net profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

$$= \text{Profit margin} \times \text{Total asset turn over} \times \text{Equity multiplier}$$

$$= \text{ROA} \times \text{Equity multiplier}$$

- Focuses on:

1. Expense control
2. Asset utilization
3. Debt utilization

- Menggambarkan bagaimana faktor-faktor tersebut menjadi satu untuk menentukan nilai ROE.

Uses for Financial Statement Information

- Internal uses:
  - performance evaluation
  - planning for the future
- External uses:
  - evaluation by outside parties
  - evaluation of main competitors
  - identifying potential takeover targets

Benchmarks for Comparison

- Ratios are most useful when compared to a benchmark.
- Time-trend analysis—examine how a particular ratio(s) has performed historically.
- Peer group analysis—using similar firms (competitors) for comparison of results.
- Global Industry Classification Standard (GICS) used by ASX is a useful way to find a peer company.

Problems with Ratio Analysis

- No underlying theory to identify correct ratios to use or appropriate benchmarks.
- Benchmarking is difficult for diversified firms.
- Firms may use different accounting procedures.
- Firms may have different recording periods.
- One-off events can severely affect financial performance.

CASH MANAGEMENT

Ummu Salma Al-Azizah

Introduction

- Proses dalam peramalan, pengumpulan, pengeluaran, investasi dan perencanaan mengenai cash perusahaan yang diperlukan dalam operasional perusahaan.
- Cash: aktiva yang paling likuid.
- Memberikan keuntungan yang kecil dibandingkan dengan deposito.

Key Areas of Cash management

- Organization
- Collection and disbursement of funds
- Netting of interagency payments
- Investment of excess funds
- Optimal level of cash balances
- Cash planning and budgeting
- Bank relations

The need for cash

- Transaction motive, untuk keseimbangan antara cash inflow dan cash outflow.
- Precautionary motive; memperkirakan arus kas dimasa depan untuk hal-hal yg tidak pasti.
- Speculative motive; perusahaan berusaha untuk menambah jumlah kas yang diperlukan untuk penggunaan investasi yang atraktif, cth: takeover market.

Optimum Cash Level

- Kebutuhan perusahaan berbeda, maka jumlah kepemilikan cash juga akan berbeda setiap waktu antara perusahaan. Hal ini dipengaruhi oleh beberafa faktor, yaitu:

1. Peramalan kas masuk dan keluar perusahaan di masa yang akan datang.
2. Manajemen kas yg dilakukan oleh perusahaan (efisien atau tidak).
3. Ketersediaan aset likuid bagi perusahaan.
4. Kemampuan perusahaan dalam melakukan pinjaman.
5. Toleransi perusahaan terhadap risiko, or risk appetite.

Cash Flow Problems

- Perusahaan memiliki permasalahan dalam cash flow dengan berbagai alasan, yaitu:

a. Inflasi
b. Cash management
c. Redemption of debt in non current asset.

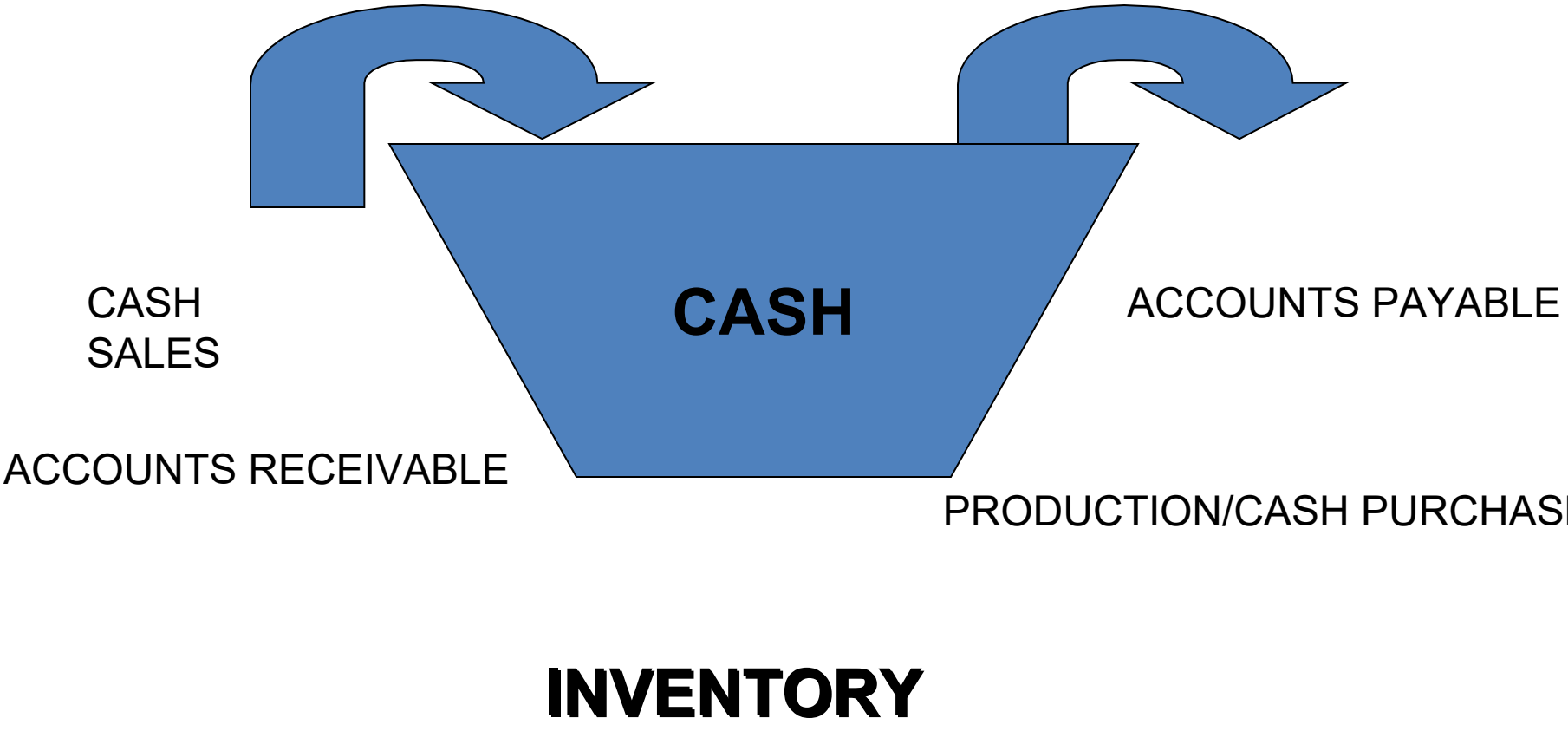
Penanggulangan Cash Problems

1. Menunda pengeluaran cash of capital yang tidak perlu. Cth: penawaran discount terhadap pembayaran cepat kepada customers.
2. Melakukan investasi dari dana surplus.
3. Mengurangi dan menunda cash outflow. Cth: memperlambat pembayaran kepada supplier.

Cash Flow Cycle

• Order goods	
• Receive goods	14
• Pay invoice	25
• Sell goods	178
• Deliver goods	3
• Send invoice	9
• Customer pays	50
• Total	240 days

Cash Flow


CASH
SALES
ACCOUNTS RECEIVABLE
CASH
ACCOUNTS PAYABLE
PRODUCTION/CASH PURCHASE
INVENTORY

Cash Management Models

1. Model persediaan (Baumol Model), 1952. Model ini mengidentifikasikan bahwa kebutuhan terhadap kas dalam suatu perusahaan sama dengan pemakaian persediaan (inventory).

   Saldo kas tinggi : kehilangan kesempatan dalam berinvestasi yang menguntungkan.

   Saldo kas rendah: mengalami masalah likuiditas.

Persamaan Baumol:

$$Q = [(2oD/i)]^{1/2}$$

Example

1. Kebutuhan kas setiap tahun adalah $1.2 juta, dan pemakaiannya per hari secara konstan. Biaya transaksi setiap kali merubah sekuritas menjadi cash adalah $50. tingkat bunga yang diperoleh dari kepemilikan sekuritas tersebut adalah sebesar 12% per tahun. Hitunglah jumlah sekuritas yang harus dirubah menjadi kas setiap kali!

Answer

1. Diketahui: o = $50; D = $1.2 juta; I = 12%

   Maka, Q = ?

   Q = $[(2oD/i)]^{½}$

Q = $[(2 \times \$50 \times \$1.2 \text{ juta}/ 0.12)]^{1/2}$

= 31,622.7760 juta = 31,623 juta

Hal ini menunjukkan bahwa perusahaan perlu menjual sekuritas sejumlah $31,623 juta setiap kali jumlah kasnya mencapai nol (0). Maka, minimalisasi biaya hilangnya kesempatan investasi pada sekuritas dan cost transaction adalah:

1. Opportunity cost = ($31,623 juta/2) x 0.12 = $1,897 juta
2. Cost transaction= ($1.2 juta/31,623) x $50 = $1,897 juta

Total biaya = 2x($1,897 juta) = $3,794 juta

Problem with Baumol Model

- Arus kas tidak bisa diprediksi, terutama dengan nilai konstan.
- Treasurers menginginkan safety stock dari uang kas.

The Miller – Orr Model

- Batas atas dan batas bawah dari nilai kas yang ada.
- Saldo kas pada batas atas, maka perusahaan perlu merubah jumlah tertentu dari kas sampai batas normal.
- Saldo kas pada batas bawah, perusahaan akan menjual sejumlah sekuritas agar saldo kas kembali meningkat.
- Persamaan yang digunakan:

$$z = [(3o\ 8^2)/\ 4i]\ ⅓$$

Example

1. Jika nilai o = $50; 8²= 2.3juta²; I = 12% per tahun, dan batas bawah ditentukan dengan nol rupiah. Maka z adalah

   Z = [3 x ($50)(2.3juta)²/ 4(0.12/365)] ⅓

   Z = $8.45 juta

Nilai batas adalah = 3($8.45 juta) = $25.35 juta

Pada saat saldo kas mencapai $25.35 juta, maka perusahaan harus merubah sejumlah $16.90 juta ($25.35jt - $8.45jt) menjadi sekuritas. Sebaliknya pada saat saldo kas mencapai titik nol, perusahaan harus menjual sekuritas senilai $8.45jt agar saldo kas menjadi $8.45jt.

Cash Management Technique

1. Synchronizing Cash Flow; menyediakan cash pada saat diperlukan dan perusahaan dapat mengurangi jumlah cash balance.
2. Speeding up the check clearing process
3. Using float; perbedaan yang terjadi pada balance yang ada di perusahaan dan yang ada di pencatatan bank.
4. Speeding up collections: lockboxes system dan payment by wire or automatic debit

Portfolio Investasi

- Jumlah saldo kas (cash balance) akan di depositokan dalam jangka waktu tertentu atau digunakan untuk investasi pada berbagai jenis saham yang ada.
- Hal ini dilakukan untuk mengoptimalkan pemanfaatan kas.

END OF CHAPTER

ACCOUNT RECEIVABLES MANAGEMENT

Prepared: Ummu Salma Al-Azizah

Introduction

- Piutang: kekayaan perusahaan yang ada sebagai akibat adanya penjualan dalam bentuk kredit, dengan tujuan mendapakan laba yang optimal dan resiko minimal.
- Piutang: cash inflow di masa mendatang, atau cash inflow yang akan terjadi.
- Merupakan bagian terbesar dari current asses, sehingga memerlukan banyak staff dalam pengelolaannya.

Tujuan

1. Semua tagihan terbayar dalam waktu sesingkat mungkin
2. Minimalisasi receivables cycle
3. Meminimalisasikan biaya dari pengumpulan piutang dagang

Faktor-faktor yang mempengaruhi besar kecilnya piutang:

1. Jumlah penjualan kredit
2. Syarat pembayaran penjualan kredit
3. Ketentuan tentang pembayaran kredit
4. Kebijakan dalam pengumpulan piutang
5. Kebiasaan para pelanggan
6. Lama persyaratan kredit
7. Karakteristik industri

Pengumpulan Piutang dan Kebijakan Kredit

1. Standard kredit; variable yang harus dipertimbangkan dalam pemberian kredit adalah:
- kualitas piutang dagang yang dapat diterima
- jangka waktu periode piutang
- potongan tunai untuk pembayaran lebih awal
- program pengumpuln piutang
2. Termin kredit; lamanya waktu yang diberikan untuk kredit dan potongan tunai jika pembayaran dilakukan lebih awal.

3. Potongan tunai; jumlah persentase pengurangan pembayaran dari total penjualan, karena pembayaran dilakukan dalam periode potongan tunai.
4. Default Risk; kerugian dari piutang dagang tidak tertagih yang mungkin terjadi, karena longgarnya standard kredit dan perlambatanwaktu pengumpulan hutang.

Biaya-biaya yang Berkaitan dengan Receivables

a. Biaya penghapusan hutang
b. Biaya pengumpulan piutang
c. Biaya administrasi
d. Biaya sumber dana/ modal

Receivables Management

1. Perencanaan jumlah dan pengumpulan piutang; disusun berdasarkan budget penjualan, pengaruh dari sejumlah piutang tak tertagih.
2. Pengendalian piutang (penyaringan pelanggan, penentuan resiko kredit, penentuan discount, administrasi, dan penentuan ketentuan bagi penunda pembayaran piutang).
3. Penggunaan Rasio.

Penilaian Terhadap Calon Pembeli (Resiko Kredit)

1. Character
2. Capacity
3. Capital
4. Collateral
5. Conditions

Penentuan Resiko Kredit

- Penentuan batas tertinggi resiko kredit
- Mengadakan klasifikasi pelanggan
- Seleksi pelanggan tetap

Perputaran Piutang

- Merupakan periode waktu terikatnya dana pada piutang

  Kas □ Inventory □ Piutang □ Kas
- Periode perputarannya piutang tergantung dari panjang pendeknya ketentuan waktu yang dipersyaratkan dalam syarat pembayaran kredit
- Tingkat perputaran piutang : $\frac{\text{Penjualan netto kredit}}{\text{Rata-rata piutang}} = \ldots . X$

  – Penjualan netto kredit adalah semua penjualan kredit sesudah dikurangi potongan-potongan.
  – Rata-rata piutang dapat dihitung dari piutang awal (neraca awal) ditambah piutang akhir (neraca akhir) dibagi dua.

Pengumpulan Piutang

- Rata-rata pengumpulan piutang :

$$\frac{\text{365 hari}}{\text{Tk. Perputaran piutang}} = \text{…… hari}$$

Catatan : *literature Amerika biasanya menggunakan angka 365 hari dalam menentukan rata-rata pengumpulan piutang.*

Pengumpulan Piutang

Kegunaan Hari rata2 pengumpulan piutang untuk menilai efisiensi dalam pengumpulan piutang:

1. Efisien

   Jika rata2 pengumpulan piutang < waktu piutang yang telah ditetapkan.

2. Inefisien

   Jika rata2 pengumpulan piutang > waktu piutang yang telah ditetapkan.

EXAMPLE

	2007	2008
• Penjualan kredit	Rp. 100 juta	Rp. 100 juta
• Piutang awal tahun...	Rp. 20 juta	Rp. 30 juta
• Piutang akhir tahun.....	Rp. 30 juta	Rp. 10 juta
• Rata-rata piutang	Rp. 25 juta	Rp. 20 juta
• Tingkat perputaran piutang	4 kali	5 kali
• Rata-rata pengumpulan piutang	91 hari	73 hari

Dapat dibandingkan dengan:

1. **batas waktu pembayaran**
2. **rata-rata periode sebelumnya,**
3. **rata-rata perusahaan lain *yang sejenis usahanya.***

Latihan Soal

Keterangan	2007	2008
Net Credit Sales	200.000.000	300.000.000
Reciavable :		
Awal tahun	35.000.000	50.000.000
Akhir tahun	45.000.000	50.000.000
Average Reciavables	40.000.000	
50.000.000		
Reciavables Turnover	?	?
Average Collection Period	?	?

Analisis Ekonomi
Penjualan Tunai VS Penjualan Kredit

Perusahaan DOWNY di Dublin semula melakukan penjualan secara tunai. Penjualan yang tercapai setiap tahun rata-rata sebesar Rp 800.000.000,00

Perusahaan merencanakan akan menawarkan syarat penjualan n/ 60. Ini berarti bahwa pembeli bisa membayar pembelian mereka pada hari ke 60.

Diperkirakan dengan syarat penjualan yang baru tersebut akan dapat meningkatkan penjualan sampai dengan Rp 1.050.000.000,00. Profit margin yang diperoleh sekitar 15%

Apakah perusahaan perlu beralih ke penjualan kredit jika biaya dana sebesar 16 % ?

ANALISA PENJUALAN KREDIT TANPA DISKON DENGAN PENJUALAN TUNAI

Manfat

Tambahan keuntungan karena tambahan penjualan

15 % x (Rp 1.050.000.000 – Rp 800.000.000) =**Rp 37.500.000,00**

Pengorbanan :

Perputaran piutang = 365 : 60 hari = 6 kali/satu tahun.

Rata-rata piutang Rp 1.050.000.000,00 : 6 =Rp 175.000.000,00

- Dana yang diperlukan untuk membiayai dana yang diinvestasikan dalam Piutang sebesar harga pokoknya

  85 % x Rp 175.000.000,00 = Rp 148.750.000,00
- Biaya dana yang harus ditanggung karena memiliki tambahan piutang

  16% x Rp 148.750.000,00 = Rp 23.800.000,00

Tambahan manfaat bersih = Rp 37.500.000,00 - Rp 23.800.000,00

= **Rp 13.700.000,00**

Quiz.....

Sebelum menerapkan kebijakan kredit, dalam 1 tahun PT Royal mampu mendapatkan omset penjualan rata2 sebesar Rp 1,2 M

Tahun depan perusahaan berencana menjual secara kredit dengan syarat n/30.

Dengan kebijakan tersebut, direncanakan perusahaan mampu meningkatkan omset penjualan menjadi Rp 1,8 M dengan profit marjin 10%

Apakah sebaiknya perusahaan menerapkan penjualan tunai / kredit jika bunga di pasar 18%

Menjual Secara kredit dengan Diskon

Berdasarkan contoh dimuka misalnya perusahaan menawarkan syarat penjualan 2/20 n/60. Diperkirakan 50% akan memanfaatkan diskon dan sisanya membayar pada hari ke 60.

Apakah perusahaan menjual dengan diskon atau menjual tanpa diskon????

 Manfaat

Tambahan keuntungan

15 % x (Rp 1.050.000.000 – Rp 800.000.000) = Rp 37.500.000

 Pengorbanan

- Periode pengumpulan piutang = (50% x 20) + (50% x 60) = 40 hari
- Perputaran piutang = 365 : 40 = 9 kali
- rata2 piutang = Rp 1.050.000.000 : 9 = Rp 116.666.600
- Dana yang dibutuhkan = 85% x Rp 116.666.600 =Rp 99.166.000

Jml Pengorbanan :

- Biaya Modal = 16% x Rp 99.166.000 = Rp 15.866.000
- Diskon = 2% x 50% x Rp 1.050.000.000 = Rp 10.500.000 +

Rp 26.366.000

 Tambahan Keuntungan

= Rp 37.500.000 - Rp 26.366.000 = Rp 11.134.000

END OF CHAPTER

FINANCIAL PLANNING AND FORECASTING

Instructor: Ummu Salma Al-Azizah

Some Bad Forecasts

- “Everything that can be invented has been invented.”
- “But what…is it good for?”
- “There is no reason anyone would want a computer in their home.”
- “I think there is a world market for maybe five computers.”
- “We don’t like their sound, and guitar music is on the way out.”

Topics in Chapter

- Financial planning
- Additional funds needed (AFN) equation
- Forecasted financial statements

1. Sales forecasts
2. Operating input data
3. Financial policy issues

- Changing ratios

Forecasting

- Hal apa yang paling utama diperkirakan ketika memulai bisnis?
- Hal apa yang paling sulit dalam melakukan perkiraan bisnis?

Elements of Strategic Plans

- Mission statement
- Corporate scope
- Statement of corporate objectives
- Corporate strategies
- Operating plan
- Financial plam

Proses Perencanaan Keuangan

- Memperkirakan laporan laba rugi berdasarkan perencanaan alternatif operasional perusahaan.
- Menentukan jumlah biaya modal yang diperlukan untuk menjalankan rencana.
- Memperkirakan dana yang akan digunakan dan mengidentifikasi keperluan dana eksternal untuk penambahan modal usaha.
- Menggunakan sistem kompensasi manajemen.
- Manajemen melakukan pengawasan operasional perusahaan.

Pro Forma Financial Statements

Three important uses:

1. Memperkirakan jumlah dana eksternal yang diperlukan
2. Evaluasi dampak dari perubahan rencana operasional yang memiliki nilai tambah bagi perusahaan
3. Menentukan target yang sesuai dengan rencana

Steps in Financial Forecasting

- Forecast sales
- Project the assets needed to support sales
- Project internally generated funds
- Project outside funds needed
- Decide how to raise funds
- See effects of plan on ratios and stock price

Example

- 2011, penjualan pada American Pulp and Paper adalah $60 juta. 2012, manajemen meyakini bahwa penjualan akan meningkat sebesar 20%, dengan penambahan profit margin 5% dan dividend payout ratio 40%. Tidak ada penambahan kapasitas

AFN - Problem 1 AP&P Co.

• Cash	$	3.0	
• A/R		3.0	
• Inventory		5.0	
• C/Assets		$	11.0
• Fixed Assets		3.0	
• Total Assets	$	14.0	

AFN - Problem 1 AP&P Co.

• A/P	$ 2.0	
• Notes Payable		1.5
• C/Liabs	$ 3.5	
• L/T Debt		3.0
• Common Equity	7.5	
• Total Liabs & Cmn Equity	$ 14.0	

AFN - Problem 1 AP&P Co.

• Sales	$	60.0	
• X Profit Margin		x .05	
• = Profit (NI)	$	=3.0	
• - Div Payout (40%)			- 1.2
• = Addts to RE			=1.8

Problem #2
2011 Balance Sheet

Cash & sec.	**$20**	**Accts. pay. & accruals**	**$100**
Accounts rec.	**240**	**Notes payable**	**100**
Inventories	**240**	**Total CL**	**$200**
Total CA	**$500**	**L-T debt**	**100**
		Common stk	**500**
Net fixed Assets	**500**	**Retained Earnings**	**200**
Total assets	**$1000**	**Total claims**	**$1000**

Prob #2
2011 Income Statement

Sales	**$2,000.00**
Less: COGS (60%)	**1,200.00**
SGA costs	**700.00**
EBIT	**$100.00**
Interest	**16.00**
EBT	**$84.00**
Taxes (40%)	**33.60**
Net income	**$50.40**
Dividends (30%)	**$15.12**
Add'n to RE	**35.28**

Key Ratios

	NWC	Industry	Condition
BEP	10.00%	20.00%	Poor
Profit Margin	2.52%	4.00%	Poor
ROE	7.20%	15.60%	Poor
DSO	43.20 days	32.00 days	Poor
Inv. turnover	8.33x	11.00x	Poor
F.A. turnover	4.00x	5.00x	Poor
T.A. turnover	2.00x	2.50x	Poor
Debt/assets	30.00%	36.00%	Good
TIE	6.25x	9.40x	Poor
Current ratio	2.50x	3.00x	Poor
Payout ratio	30.00%	30.00%	O.K.

Key Ratios (Continued)

	NWC	Ind.	Cond.
Net oper. prof. margin after taxes (NOPAT/Sales)	**3.00%**	**5.00%**	**Poor**
Oper. capital requirement (Net oper. capital/Sales)	**45.00%**	**35.00%**	**Poor**
Return on invested capital (NOPAT/Net oper. capital)	**6.67%**	**14.00%**	**Poor**

AFN (Additional Funds Needed): Key Assumptions

- Operating at full capacity in 2011.
- Each type of asset grows proportionally with sales.
- Payables and accruals grow proportionally with sales.
- 2011 profit margin (2.52%) and payout (30%) will be maintained.
- Sales are expected to increase by $500 million. (%□S = 25%)

Balance Sheet, Hatfield, 12/31/10

Cash and securities	$20
Accounts receivable	290
Inventories	390
Total current assets	$700
Net fixed assets	500
Total assets	$1,200
Accounts pay. + accruals	$100
Notes payable	80
Total current liabilities	$180
Long-term debt	520
Total liabilities	$700
Common stock	300
Retained earnings	200
Total common equity	$500
Total liab. & equity	$1,200

Income Statement, Hatfield, 2010

Sales	$2,000
Total operating costs	1,900
EBIT	$100
Interest	60
EBT	$40
Taxes (40%)	16
Net income	$24
Dividends	$9
Add'n to retain. earnings	$15
Shares outstanding	10
EPS	$2.40
DPS	$0.90
Year-end stock price	$24.00

Comparison of Hatfield to Industry Using DuPont Equation

$$ROE = NI/S \times S/TA \times TA/E$$

NI/S = \$24/\$2,000 = 1.2%

S/TA = \$2,000/\$1,200 = 1.67

TA/E = \$1,200/\$500 = 2.4

$ROE_{Hatfield} = 1.2\% \times 1.67 \times 2.4 = 4.8\%.$

$ROE_{Industry} = 2.74\% \times 2.0 \times 2.13 = 11.6\%.$

Comparison

- Profitability ratios lebih rendah karena interest expense lebih tinggi.
- Asset management ratios lebih rendah karena tingginya tingkat receivables dan inventory.
- Higher leverage dari industry.

AFN Equation: Key Assumptions

- Operating at full capacity pada 2010.
- Penjualan diperkirakan meningkat 15% ($300 jt).
- Rasio aset terhadap penjualan tetap sama.
- Nilai hutang terhadap penjualan tetap.
- Profit margin 2010 = 1,2% ($24/$2,000) dan payout ratio 35% akan tetap sama.

Definitions of Variables in AFN

- A_0^*/S_0: Assets required to support sales: called capital intensity ratio.
- ΔS: Increase in sales.
- L_0^*/S_0: Spontaneous liabilities ratio.
- M: Profit margin (Net income/Sales)
- POR: Payout ratio (Dividends/Net income)

Hatfield's AFN Using AFN Equation

$$AFN = (A_0^*/S_0)\Delta S - (L_0^*/S_0)\Delta S - M(S_1)(1-POR)$$

$$AFN = (\$1{,}200/\$2{,}000)(\$300) - (\$100/\$2{,}000)(\$300) - 0.012(\$2{,}300)(1 - 0.375)$$

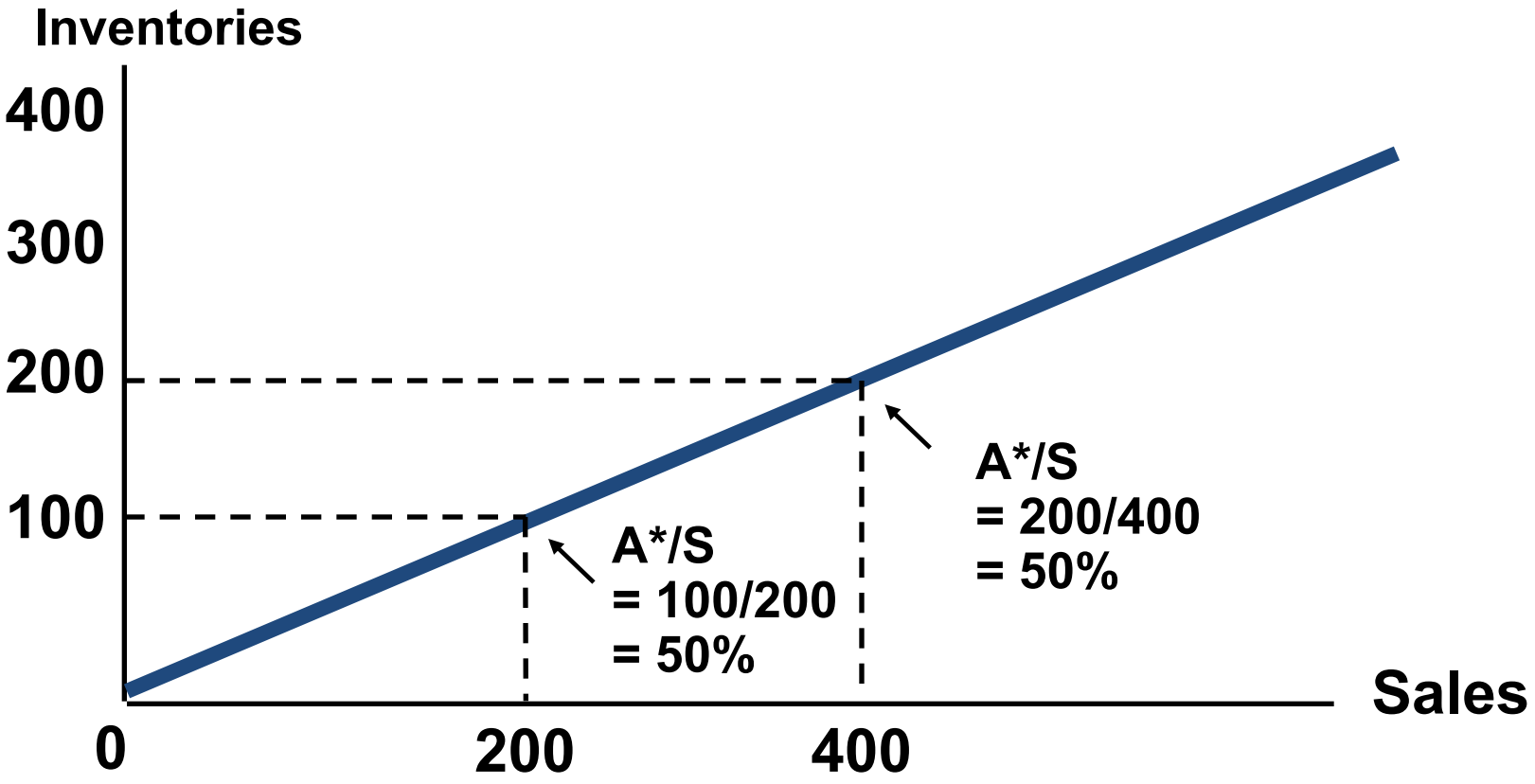
$$AFN = \$180 - \$15 - \$17.25$$

$$AFN = \$147.75 \text{ million.}$$

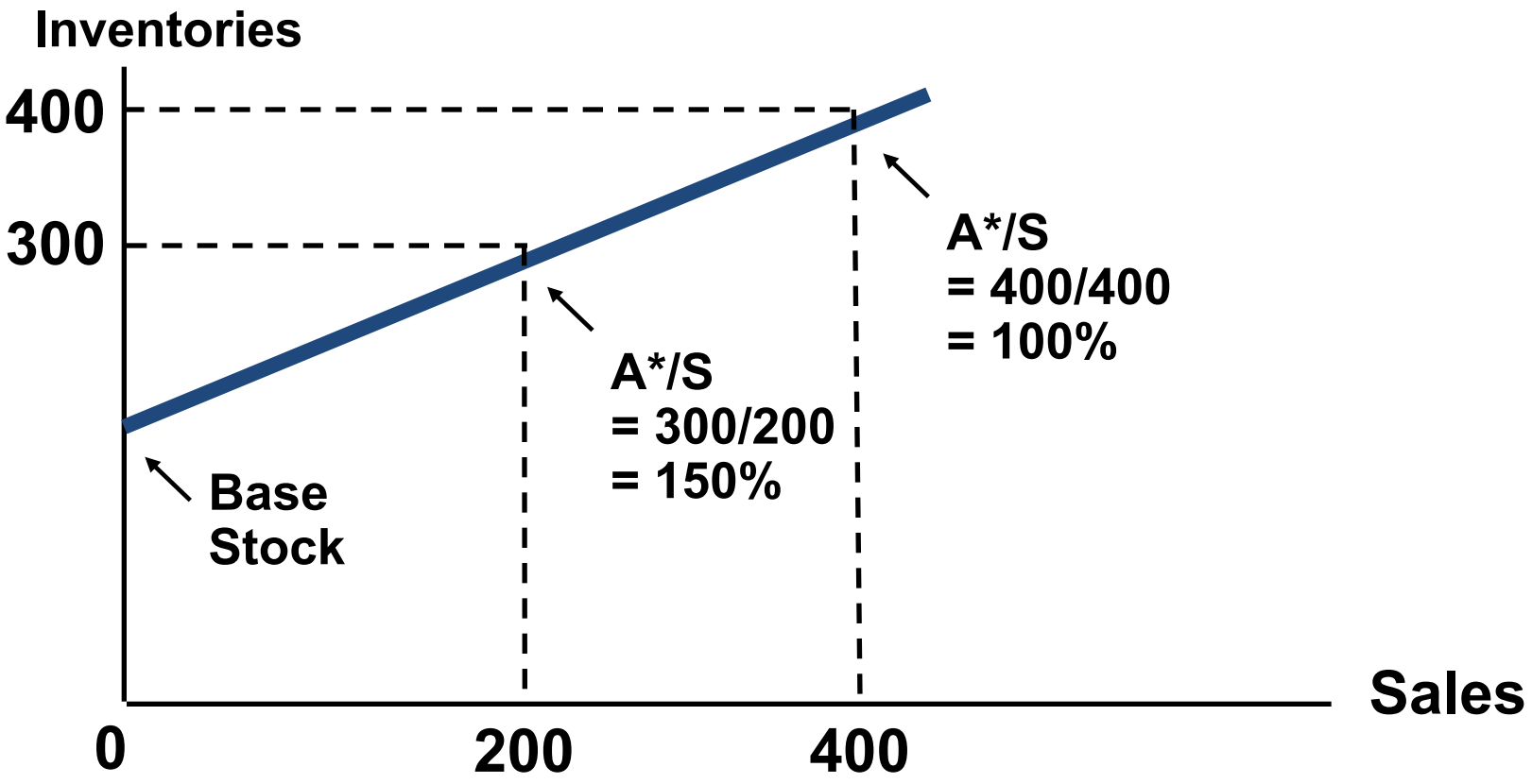
Key Factors in AFN Equation

- Sales growth (g): semakin tinggi nilai “g”, AFN semakin besar, dan hal lain konstan.
- Rasio intensitas modal: semakin tinggi, AFN tinggi.
- Semakin tingginya hutang jangka pendek perusahaan, AFN semakin rendah.
- Profit margin: semakin tinggi profit margin, AFN semakin kecil.
- Payout ratio: lower payout ratio, smaller AFN

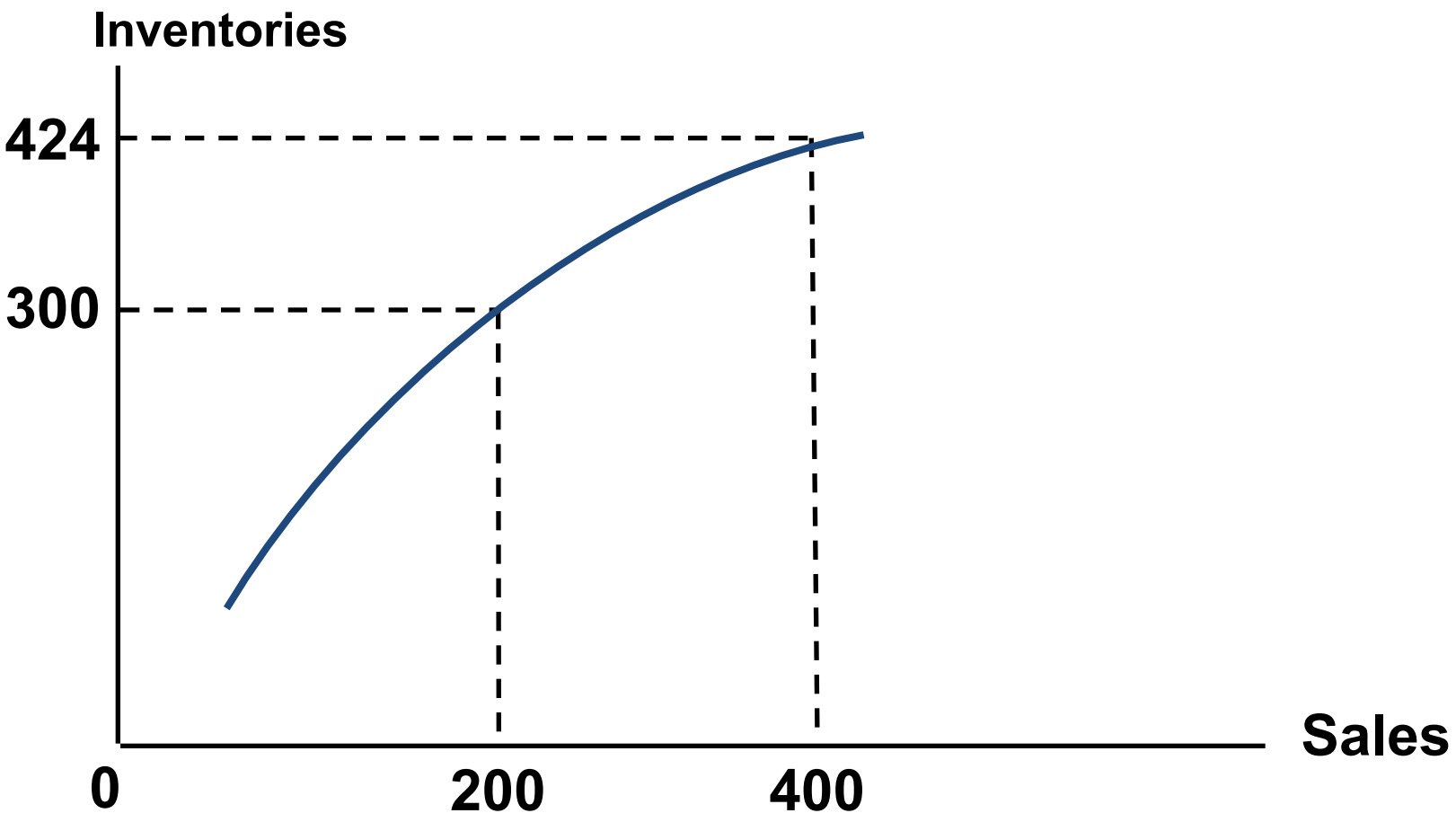
Possible Ratio Relationships: Constant A*/S Ratios



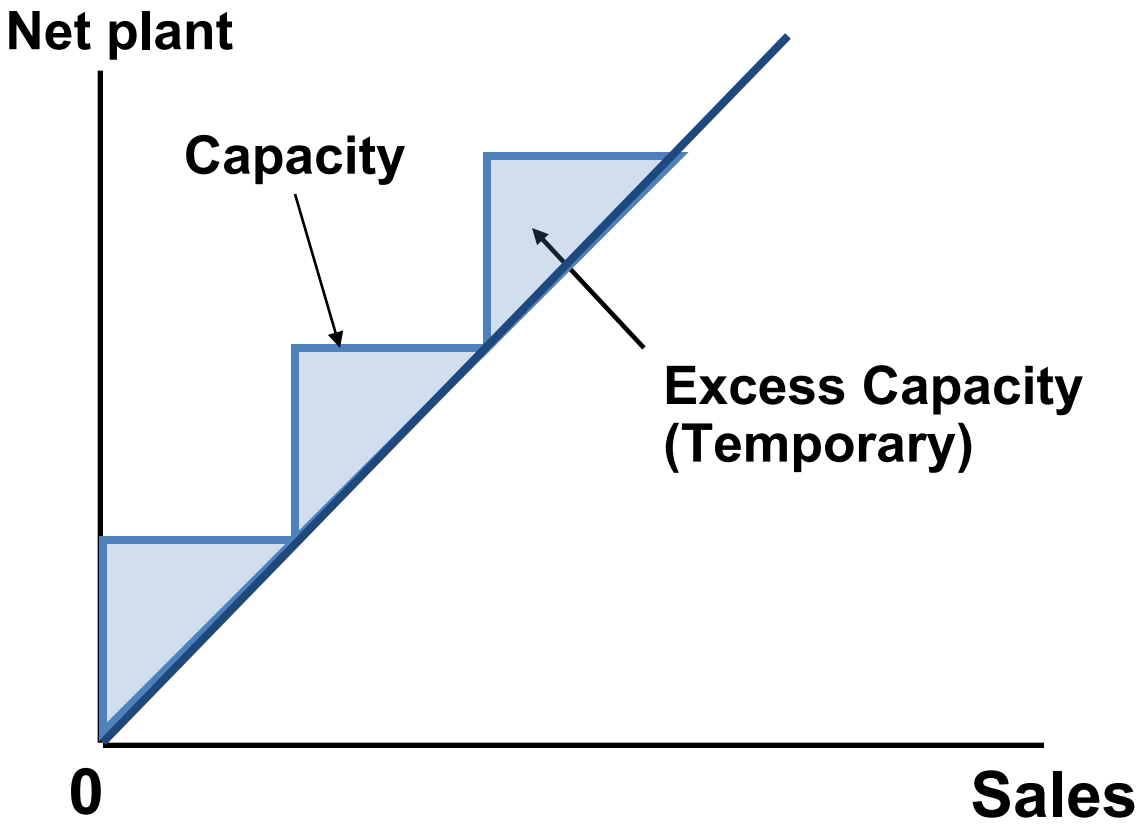
Economies of Scale in A*/S Ratios



Nonlinear A*/S Ratios



Possible Ratio Relationships: Lumpy Increments



Forecasted Financial Statements: “Steady” Ratio

- Operating ratio tetap.
- Tidak ada tambahan notes payable, long term debt, common stock.
- Interest rate pada setiap hutang 10%.
- Jika diperlukan tambahan pembiayaan, perusahaan akan menggunakan credit. Tidak ada penambahan interest expense dalam credit karena pencatatan dilakukan pada hari akhir tahun berjalan.
- Jika ada dana lebihan, akan dibayarkan pada payout ratio.
- Regular dividend akan bertambah sebesar 15%.
- Sales meningkat 15%.

Inputs for Steady Scenario and Target Scenario

Inputs for Forecasts	Hatfield 2010	Forecast Scenarios	
		Steady	Target
Sales growth rate	15.0%	15.0%	15.0%
Operating costs/Sales	95.0%	95.0%	93.0%
Cash/Sales	1.0%	1.0%	1.0%
Receivables/Sales	14.5%	14.5%	11.0%
Inventories/Sales	19.5%	19.5%	15.0%
Fixed assets/Sales	25.0%	25.0%	23.0%
Payables and accruals/ Sales	5.0%	5.0%	4.0%
Growth rate in regular dividends	15.0%	15.0%	15.0%
Interest rate on all debt	10.0%	10.0%	10.0%
Tax rate	40.0%	40.0%	40.0%

Forecasted Financial Statements: Balance Sheets for Steady Scenario

Scenario: Steady	Hatfield	Forecast		w/o AFN	With AFN
Balance Sheet	2010	Factor	Basis for 2011 Forecast	2011	2011
Assets					
Cash	$20	1.00%	Factor × Forecasted Sales	$23.0	$23.0
Accounts receivable	290	14.50%	Factor × Forecasted Sales	333.5	333.5
Inventories	390	19.50%	Factor × Forecasted Sales	448.5	448.5
Total current assets	$700			$805.0	$805.0
Net fixed assets	500	25.00%	Factor × Forecasted Sales	575.0	575.0
Total assets	$1,200			$1,380.0	$1,380.0
Liabilities & equity					
Accts pay. and accruals	$100	5.00%	Factor × Forecasted Sales	$115.0	$115.0
Notes payable: Planned	80		Carry over 2010 amount	80.0	80.0
Line of credit (LOC)	0		New LOC if AFN > 0	0	142.4
Total current liabs	$180			$195.0	$337.4
LT debt: Planned	520		Carry over 2010 amount	520.0	520.0
Total liabilities	$700			$715.0	$857.4
Common stock	300		Carry over 2010 amount	300.0	300.0
Retained earnings	200	2010 + Add'n to RE from Income St.		222.7	222.7
Total common equity	$500			$522.7	$522.7
Total liab. & equity	$1,200			$1,237.7	$1,380.0
			AFN = TA – (Planned Liab & Equity)	$142.4	$0.00
			New line of credit (if AFN > 0) =	$142.4	
			Special dividend (if AFN ≤ 0) =	$0.0	

Forecasted Financial Statements: Income Statement for Steady Scenario

Scenario: Steady	Hatfield	Forecast		w/o AFN	With AFN
Income Statement	2010	Factor	Basis for 2011 Forecast	2011	2011
Sales	$2,000.0	15.00%	(1 + Factor) × 2010 Sales	$2,300.0	$2,300.0
Total operating costs	1,900.0	95.0%	Factor × Forecasted Sales	$2,185.0	$2,185.0
EBIT	$100.0			$115.0	$115.0
Interest: NP planned	8.0	10.0%	Rate x Avg Balance	8.0	$8.0
Interest: LT debt planned	52.0	10.0%	Rate x Avg Balance	52.0	$52.0
Interest: Line of credit	0.0	10.0%	Rate x Beginning Balance	0.0	$0.0
Earnings before taxes (EBT)	$40.0			$55.0	$55.0
Taxes	16.0	40%	Tax rate × EBT	$22.0	$22.0
Net inc. for common (NI)	$24.0			$33.0	$33.0
Dividends- regular (DIVs)	$9.0	15%	(1 + g) × 2010 Dividends	$10.4	$10.4
Special dividends			Special dividend if AFN ≤ 0		$0.0
Add. to ret. earnings	$15.0		NI – all dividends	$22.7	$22.7

Forecasted Financial Statements: Income Statement for Steady Scenario

Scenario: Steady	Hatfield	Forecast		w/o AFN	With AFN
Income Statement	2010	Factor	Basis for 2011 Forecast	2011	2011
Sales	$2,000.0	15.00%	(1 + Factor) × 2010 Sales	$2,300.0	$2,300.0
Total operating costs	1,900.0	95.0%	Factor × Forecasted Sales	$2,185.0	$2,185.0
EBIT	$100.0			$115.0	$115.0
Interest: NP planned	8.0	10.0%	Rate x Avg Balance	8.0	$8.0
Interest: LT debt planned	52.0	10.0%	Rate x Avg Balance	52.0	$52.0
Interest: Line of credit	0.0	10.0%	Rate x Beginning Balance	0.0	$0.0
Earnings before taxes (EBT)	$40.0			$55.0	$55.0
Taxes	16.0	40%	Tax rate × EBT	$22.0	$22.0
Net inc. for common (NI)	$24.0			$33.0	$33.0
Dividends- regular (DIVs)	$9.0	15%	(1 + g) × 2010 Dividends	$10.4	$10.4
Special dividends			Special dividend if AFN ≤ 0		$0.0
Add. to ret. earnings	$15.0		NI – all dividends	$22.7	$22.7

Additional Financing Needed

- AFN = $142.4.
- This AFN amount AFN equation amount.
- The difference results because the profit margin doesn’t remain constant.

Forecasted Financial Statements, Target Ratios

Scenario: Target	Hatfield	Forecast		w/o AFN	With AFN
Balance Sheet	2010	Factor	Basis for 2011 Forecast	2011	2011
Assets					
Cash	$20	1.00%	Factor × Forecasted Sales	$23.0	$23.0
Accounts receivable	290	11.00%	Factor × Forecasted Sales	253.0	253.0
Inventories	390	15.00%	Factor × Forecasted Sales	345.0	345.0
Total current assets	$700			$621.0	$621.0
Net fixed assets	500	23.00%	Factor × Forecasted Sales	529.0	529.0
Total assets	$1,200			$1,150.0	$1,150.0
Liabilities & equity					
Accts pay. and accruals	$100	4.00%	Factor × Forecasted Sales	$92.0	$92.0
Notes payable: Planned	80		Carry over 2010 amount	80.0	80.0
Line of credit (LOC)	0		New LOC if AFN > 0	0	0.0
Total current liabs	$180			$172.0	$172.0
LT debt: Planned	520		Carry over 2010 amount	520.0	520.0
Total liabilities	$700			$692.0	$692.0
Common stock	300		Carry over 2010 amount	300.0	300.0
Retained earnings	200	2010 + Add'n to RE from Income St.		250.3	158.0
Total common equity	$500			$550.3	$458.0
Total liab. & equity	$1,200			$1,242.3	$1,150.0
			AFN = TA – (Planned Liab & Equity)	-$92.3	$0.00
			New line of credit (if AFN > 0) =	$0.0	
			Special dividend (if AFN ≤ 0) =	$92.3	

Forecasted Financial Statements, Target Ratios

Scenario: Target Income Statement	Hatfield 2010	Forecast Factor	Basis for 2011 Forecast	w/o AFN 2011	With AFN 2011
Sales	$2,000.0	15.00%	(1 + Factor) × 2010 Sales	$2,300.0	$2,300.0
Total operating costs	1,900.0	93.0%	Factor × Forecasted Sales	$2,139.0	$2,139.0
EBIT	$100.0			$161.0	$161.0
Interest: NP planned	8.0	10.0%	Rate x Avg Balance	8.0	$8.0
Interest: LT debt planned	52.0	10.0%	Rate x Avg Balance	52.0	$52.0
Interest: Line of credit	0.0	10.0%	Rate x Beginning Balance	0.0	$0.0
Earnings before taxes (EBT)	$40.0			$101.0	$101.0
Taxes	16.0	40%	Tax rate × EBT	$40.4	$40.4
Net inc. for common (NI)	$24.0			$60.6	$60.6
Dividends- regular (DIVs)	$9.0	15%	(1 + g) × 2010 Dividends	$10.4	$10.4
Special dividends			Special dividend if AFN ≤ 0		$92.3
Add. to ret. earnings	$15.0		NI − all dividends	$50.3	-$42.0

Performance Measures

Performance	Hatfield 2010	Forecast Scenarios	
		Steady	Target
Net operating profits after taxes	$60	$69	$97
Net operating working capital	$600	$690	$529
Total operating capital	$1,100	$1,265	$1,058
Free cash flow	NA	-$96	$139
Return on invested capital	5.5%	5.5%	9.1%
AFN	NA	$142.4	-$92.3
EPS	$2.40	$3.30	$6.06
DPS (regular dividends)	$0.90	$1.04	$1.04
Payout ratio (all dividends)	37.5%	31.4%	169.3%
Profit margin	1.2%	1.4%	2.6%
Sales/Assets (Assets turnover)	1.67	1.67	2.00
Assets/Equity	2.40	2.64	2.51
ROE	4.8%	6.3%	13.2%
Operating costs/Sales	95.0%	95.0%	93.0%
Total liability/Total assets	58.3%	62.1%	60.2%
TIE ratio	1.67	1.92	2.68

Compensation and Forecasting

- Forecasting dapat digunakan untuk mencapai target dari perencanaan yang sudah dilakukan.
- Hal utama adalah untuk memberikan kompensasi bagi pekerja yang telah melakukan penambahan nilai bagi shareholders.
- Penekanan yang dilakukan dalam jangka panjang, bukan jangka pendek.

Financing Feedback

- Forecast tidak menambahkan nilai pengeluaran pembayaran bunga terhadap kredit karena hal ini dilakukan pada hari akhor pada tahun berjalan.
- Hal ini dianggap lebih realistis untuk memberikan asumsi bahwa pencatatan tersebut memang dilakukan selama tahun berjalan.
- Penilaian pembiayaan ini terjadi ketika adanya penambahan biaya pendanaan terhadap modal eksternal perusahaan yang baru dan dimasukkan dalam analisis.

Financing Feedbacks-Circularity

- Ketika biaya pendanaan dimasukkan, NI menurun, RE juga berkurang.
- RE pada balance sheet menurun.
- Balance sheet tidak lagi akan balance.
- Memerlukan pendanaan yang lebih.
- Proses kembali diulang.

Financing Feedback-Solutions

- Proses kembali diulang, iterate sampai neraca kembali seimbang (manually, excel).
- Gunakan Excel Goal Seek untuk mendapatkan jumlah AFN.
- Menggunakan rumus manual untuk melakukan adjustment terhadap jumlah pendanaan.

Multi-Year Forecast: Special Dividends

- Board of Directors lebih baik memutuskan untuk melakukan sesuatu yang lain dan memiliki nilai lebih bukannya membayarkan kelebihan dividend.
- Hal ini seperti:

1. Pembelian kembali saham-saham dipasar.
2. Pembelian surat hutang jangka pendek.
3. Membayar lunas hutang-hutang perusahaan.
4. Melakukan akuisisi.

END OF CHAPTER

Financial Statement Analysis

Curriculum designed for use with the Iowa Electronic Markets

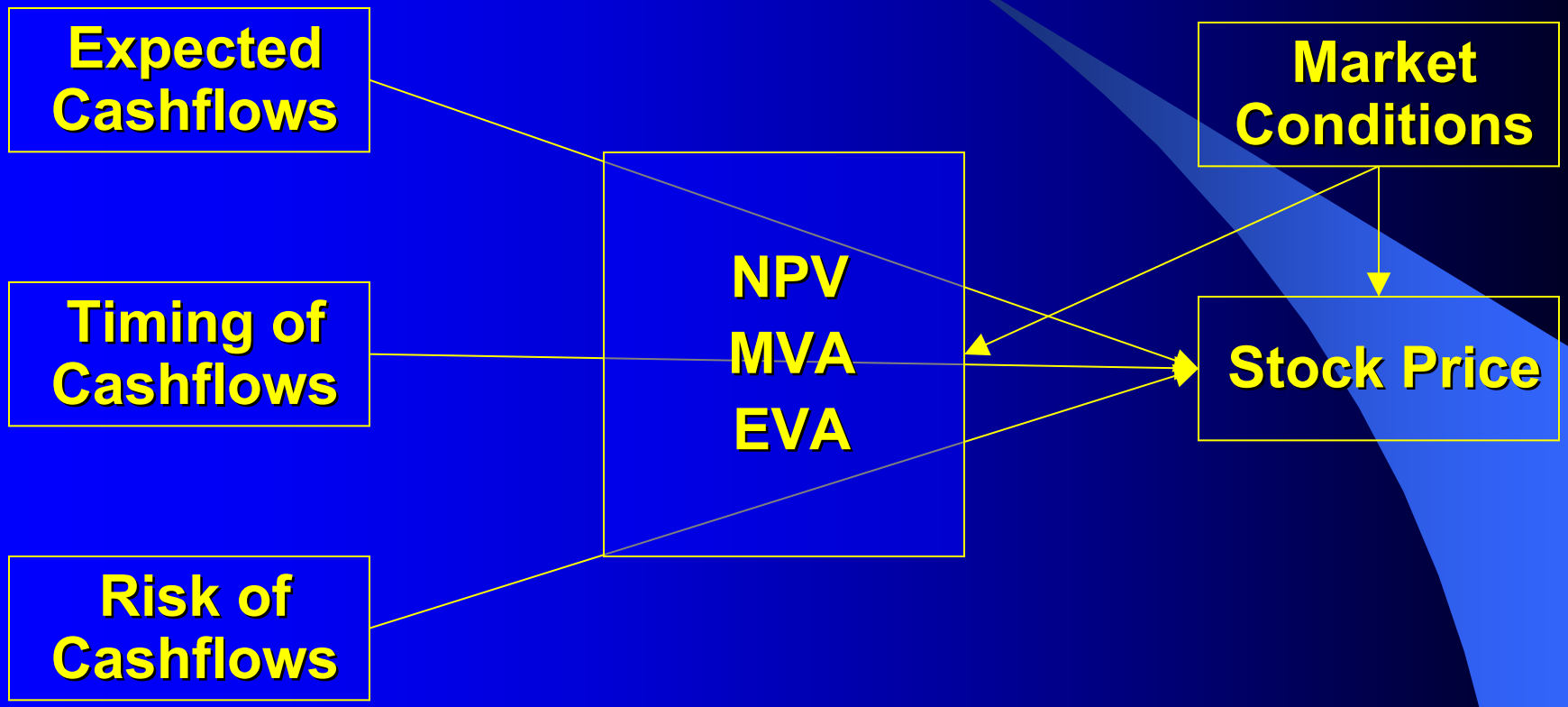
by

Cynthia J. Brown
Marilyn M. Dutton
Thomas A. Rietz

Financial Statement Analysis: Lecture Outline

- Review of Financial Statements
- Ratios
  - Types of Ratios
  - Examples
- The DuPont Method
- Ratios and Growth
- Summary
  - Strengths
  - Weaknesses
  - Ratios and Forecasting

Stock Price


Expected Cashflows
Timing of Cashflows
Risk of Cashflows
NPV
MVA
EVA
Market Conditions
Stock Price

Financial Analysis

- Assessment of the firm's past, present and future financial conditions
- Done to find firm's financial strengths and weaknesses
- Primary Tools:
  - Financial Statements
  - Comparison of financial ratios to past, industry, sector and all firms

Financial Statements

- Balance Sheet
- Income Statement
- Cashflow Statement
- Statement of Retained Earnings

Sources of Data

- Annual reports
  - Via mail, SEC or company websites
- Published collections of data
  - e.g., Dun and Bradstreet or Robert Morris
- Investment sites on the web
  - Examples
    - http://moneycentral.msn.com/investor
    - http://www.marketguide.com

The Main Idea

- Value for the firm comes from cashflows
- Cashflows can be calculated as:
  - $(Rev_t - Cost_t - Dep_t)x(1-t) + Dep_t$
    —OR—
  - $(Rev_t - Cost_t)x(1-t) + txDep_t$
    —OR—
  - $Rev_t x(1-t) - Cost_t x(1-t) + txDep_t$

Review: Major Balance Sheet Items

Assets

- Current assets:
  - Cash & securities
  - Receivables
  - Inventories
- Fixed assets:
  - Tangible assets
  - Intangible assets

Liabilities and Equity

- Current liabilities:
  - Payables
  - Short-term debt
- Long-term liabilities
- Shareholders' equity

An Example: Dell Abbreviated Balance Sheet

- **Assets:**
  - **Current Assets:** **$7,681.00**
  - **Non-Current Assets:** **$3,790.00**
  - **Total Assets:** **$11,471.00**
- **Liabilities:**
  - **Current Liabilities:** **$5,192.00**
  - **LT Debt & Other LT Liab.:** **$971.00**
  - **Equity:** **$5,308.00**
  - **Total Liab. and Equity:** **$11,471.00**

Review: Major Income Statement Items

- Gross Profit = Sales - Costs of Goods Sold
- EBITDA
  = Gross Profit - Cash Operating Expenses
- EBIT = EBDIT - Depreciation - Amortization
- EBT = EBIT - Interest
- NI or EAT = EBT- Taxes
- Net Income is a primary determinant of the firm's cashflows and, thus, the value of the firm's shares

An Example: Dell Abbreviated Income Statement

Sales	$25,265.00
Costs of Goods Sold	-$19,891.00
Gross Profit	$5,374.00
Cash operating expense	-$2,761.00
EBITDA	2,613.00
Depreciation & Amortization	-$156.00
Other Income (Net)	-$6.00
EBIT	$2,451.00
Interest	-$0.00
EBT	$2,451.00
Income Taxes	-$785.00
Special Income/Charges	-$194.00
Net Income (EAT)	$1,666.00

Objectives of Ratio Analysis

- Standardize financial information for comparisons
- Evaluate current operations
- Compare performance with past performance
- Compare performance against other firms or industry standards
- Study the efficiency of operations
- Study the risk of operations

Rationale Behind Ratio Analysis

- A firm has resources
- It converts resources into profits through
  - production of goods and services
  - sales of goods and services
- Ratios
  - Measure relationships between resources and financial flows
  - Show ways in which firm's situation deviates from
    - Its own past
    - Other firms
    - The industry
    - All firms-

Types of Ratios

- **Financial Ratios:**
  - **Liquidity Ratios**
    - **Assess ability to cover current obligations**
  - **Leverage Ratios**
    - **Assess ability to cover long term debt obligations**
- **Operational Ratios:**
  - **Activity (Turnover) Ratios**
    - **Assess amount of activity relative to amount of resources used**
  - **Profitability Ratios**
    - **Assess profits relative to amount of resources used**
- **Valuation Ratios:**
    - **Assess market price relative to assets or**

Liquidity Ratio Examples: Dell

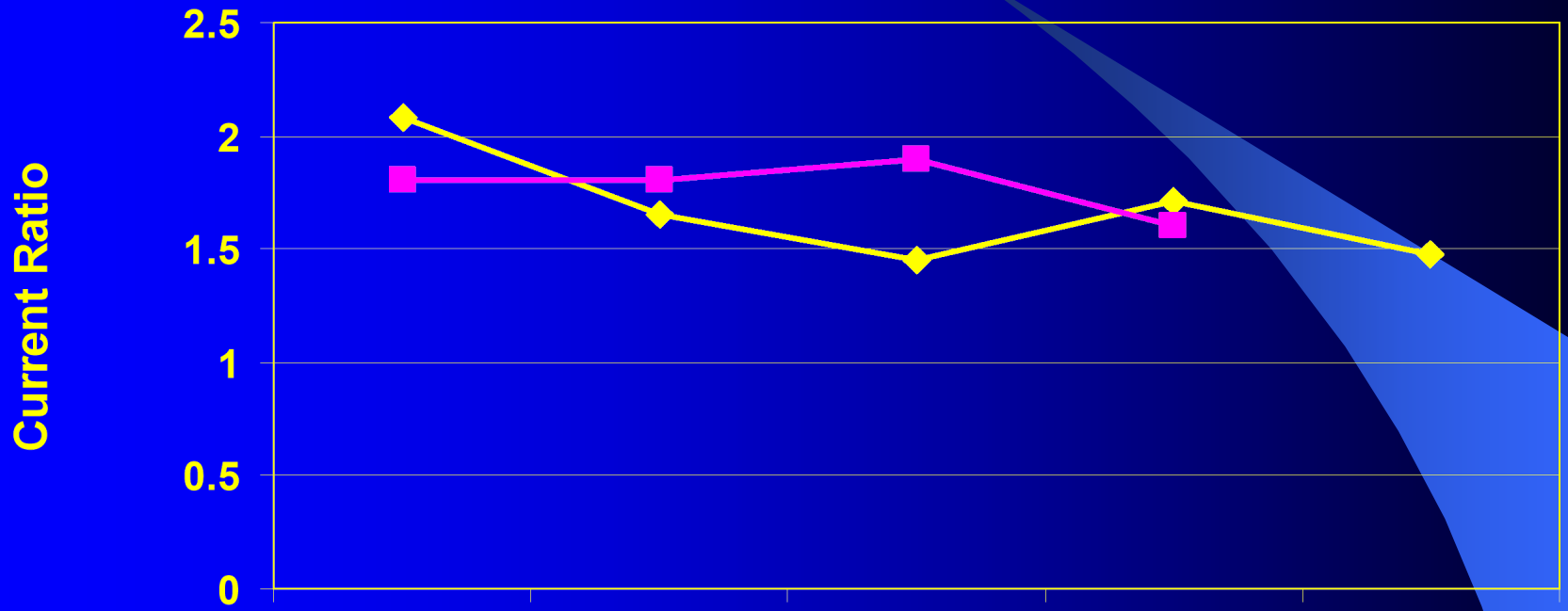
- **Current Ratio:**

$$\text{Current Ratio} := \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\$7{,}681.00}{\$5{,}192.00} = 1.48$$

- **Quick (Acid Test) Ratio:**

$$\text{Acid Test Ratio} := \frac{\text{Current Assets - Inventories}}{\text{Current Liabilities}} = \frac{\$7{,}681.00 - \$391.00}{\$1{,}107{,}000} = 1.40$$

Ratio Comparison: Current Ratio



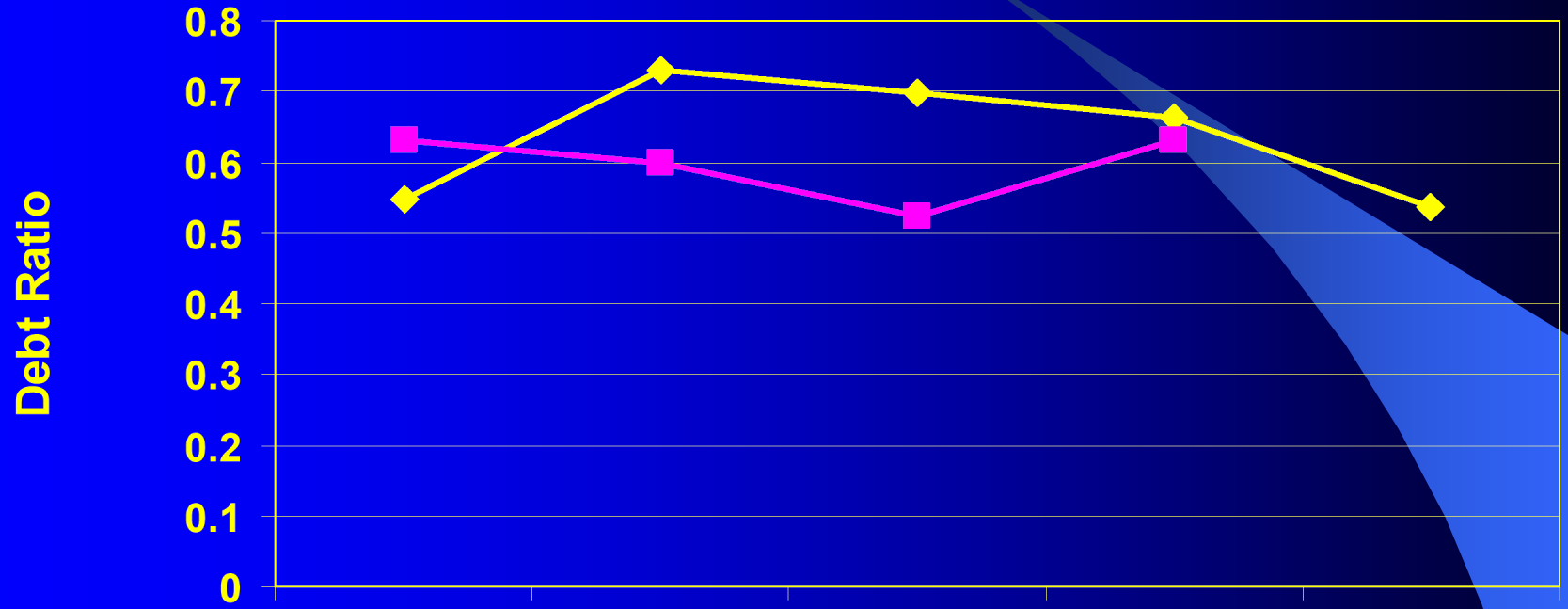
	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	2.08	1.66	1.45	1.72	1.48
Industry	1.80	1.80	1.90	1.60	

Leverage Ratio Examples: Dell

- **Debt Ratio:**

$$\text{Debt Ratio} := \frac{\text{Total Liabilities}}{\text{Total Assets}} = \frac{\$6{,}163.00}{\$11{,}471.00} = 53.73\%$$

Ratio Comparison: Debt Ratio



	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	54.70%	73.07%	69.70%	66.25%	53.73%
Industry	62.96%	60.00%	52.38%	62.96%	

Profitability Ratio Examples: Dell

- **Return on Assets (ROA):**

$$\text{ROA} := \frac{\text{Net Income}}{\text{Total Assets}} = \frac{\$1{,}666.00}{\$11{,}471.00} = 14.52\%$$

- **Return on Equity (ROE):**

$$\text{ROE} := \frac{\text{Net Income}}{\text{Total Common Equity}} = \frac{\$1{,}666.00}{\$5{,}308.00} = 31.39\%$$

Profitability Ratio Examples: Dell

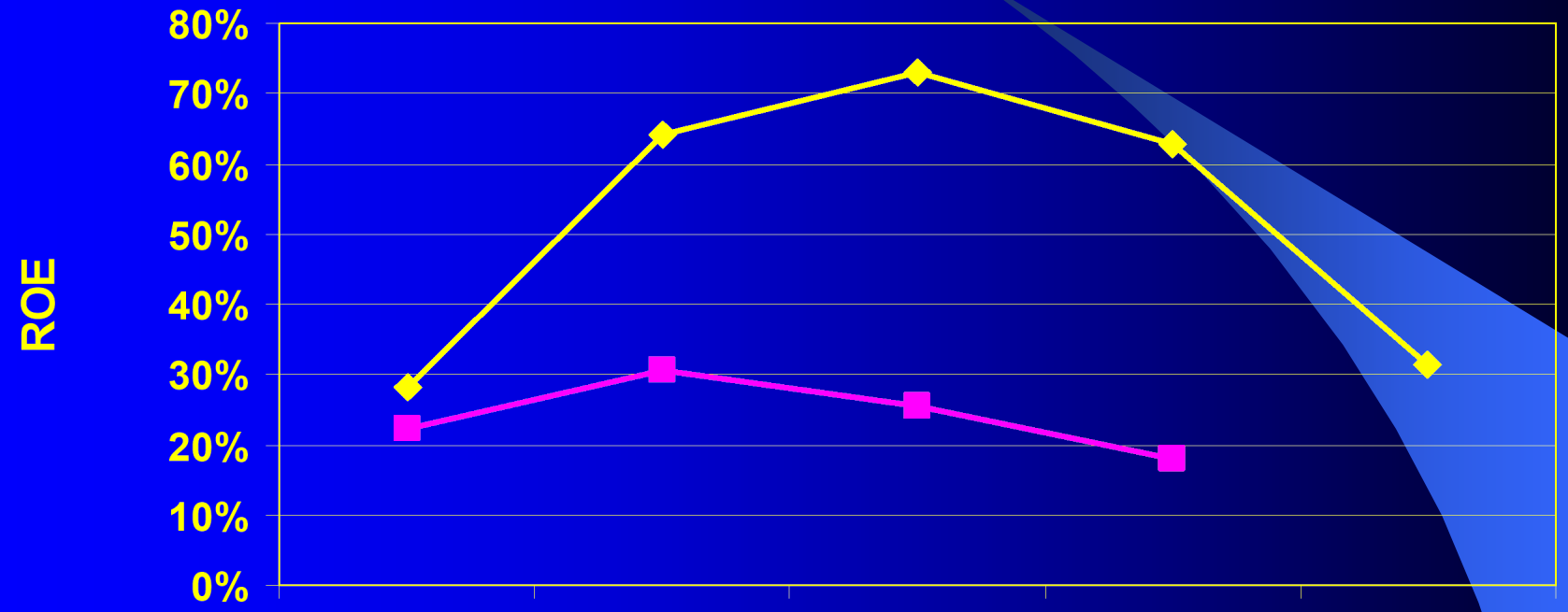
- **Net Profit Margin:**

$$\text{Net Profit Margin} := \frac{\text{EBIT}}{\text{Sales}} = \frac{\$2{,}451.00}{\$25{,}265.00} = 6.59\%$$

- **Retention Ratio**

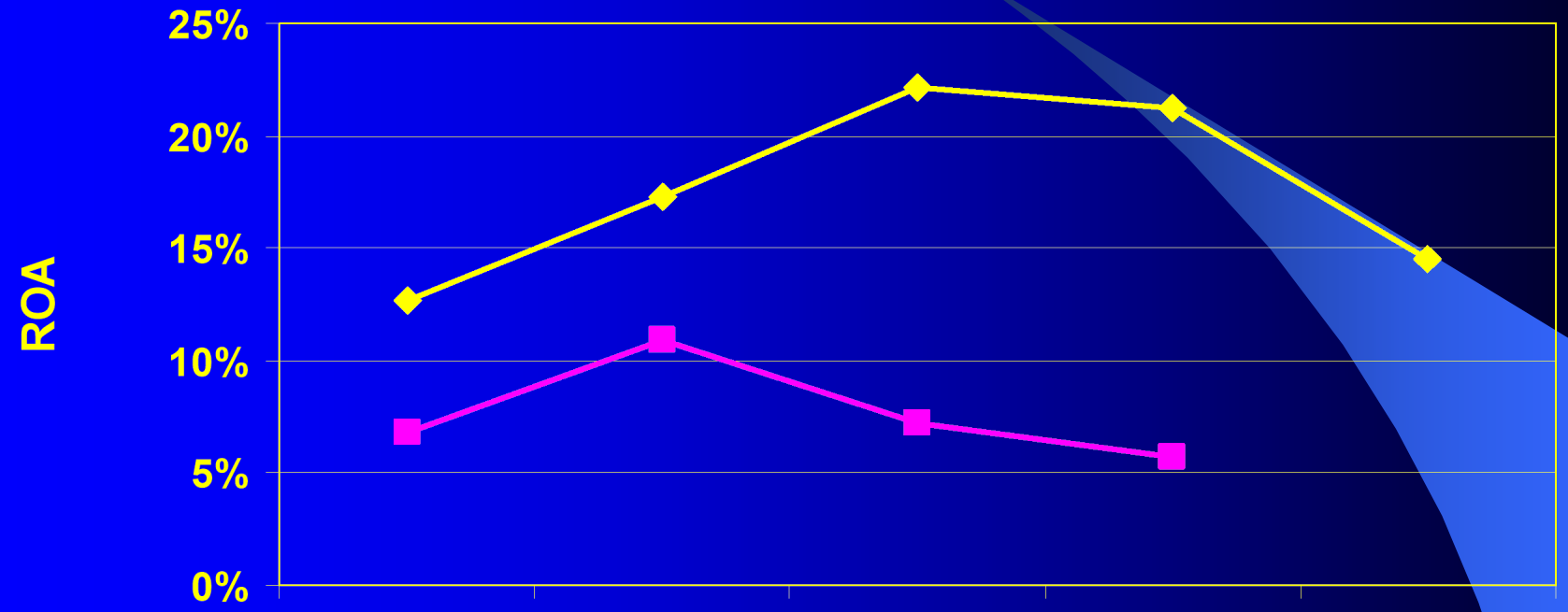
$$\text{Retention Ratio } (\rho) := \frac{\text{EPS - Div}}{\text{EPS}} = \frac{\$0.66 - \$0}{\$0.66} = 100\%$$

Ratio Comparison: ROE



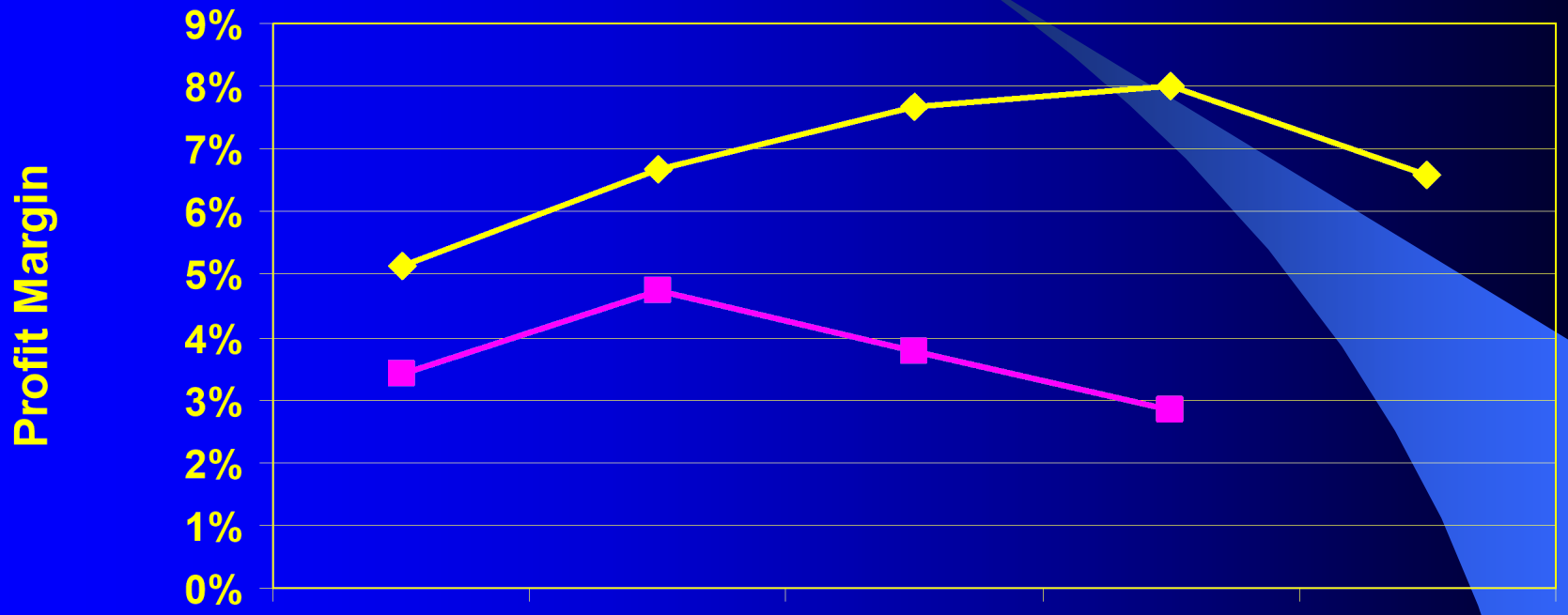
	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	28.13%	64.27%	73.01%	62.90%	31.39%
Industry	22.30%	30.60%	25.50%	18.00%	

Ratio Comparison: ROA



	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	12.66%	17.31%	22.12%	21.23%	14.52%
Industry	6.80%	10.90%	7.20%	5.70%	

Ratio Comparison: Profit Margin



	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	5.14%	6.68%	7.66%	8.00%	6.59%
Industry	3.40%	4.74%	3.79%	2.85%	

Activity (Turnover) Ratio Examples: Dell

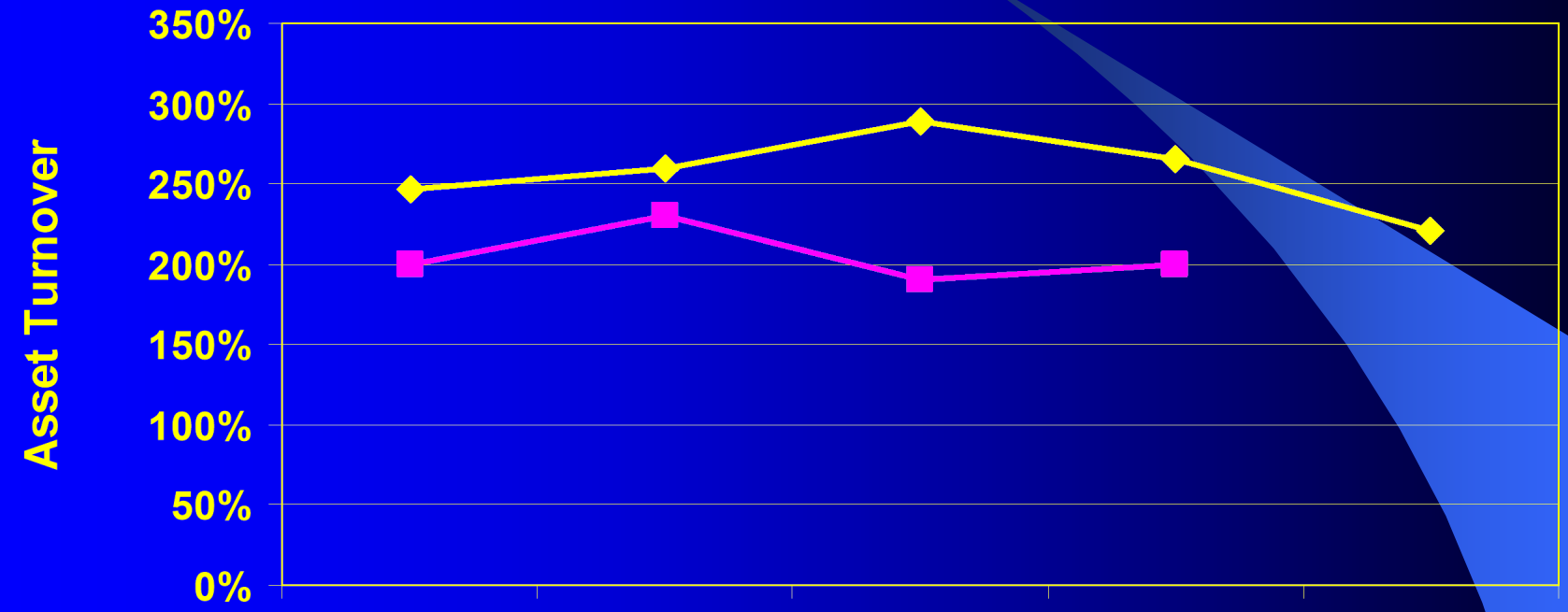
- **Total Asset Turnover Ratio:**

$$\text{Total Asset Turnover}: \frac{\text{Sales}}{\text{Total Assets}} = \frac{\$25{,}265.00}{\$11{,}471.00} = 2.20$$

- **Inventory Turnover Ratio:**

$$\text{Inventory Turnover}: \frac{\text{Sales}}{\text{Inventory}} = \frac{\$25{,}265.00}{\$391.00} = 64.62$$

Ratio Comparison: Asset Turnover

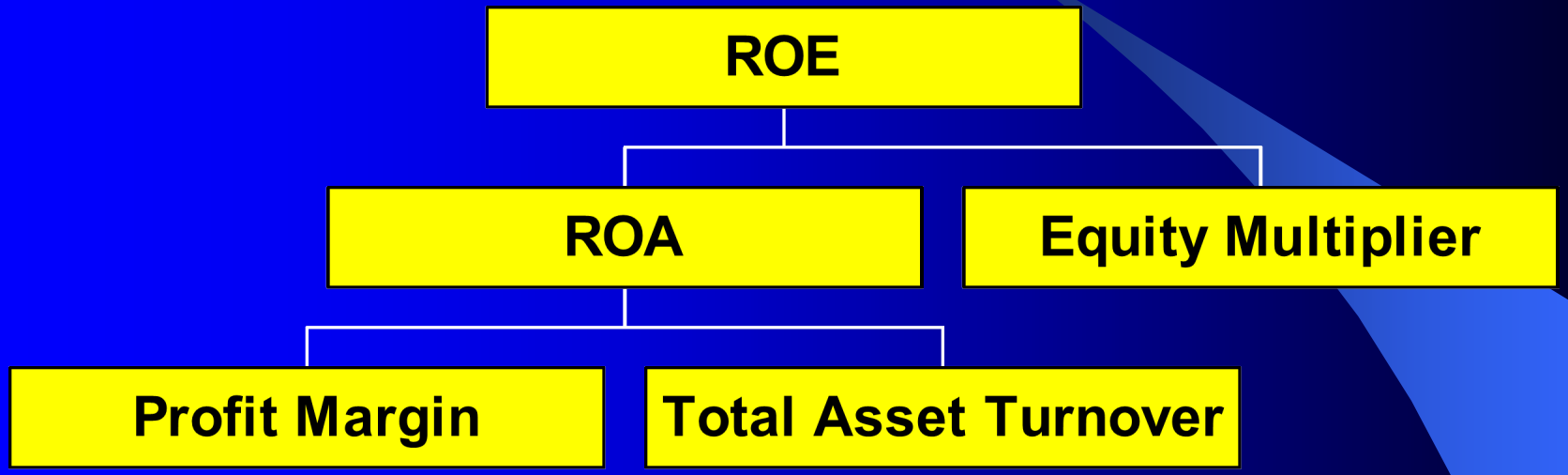


	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	2.47	2.59	2.89	2.65	2.20
Industry	2.00	2.30	1.90	2.00	

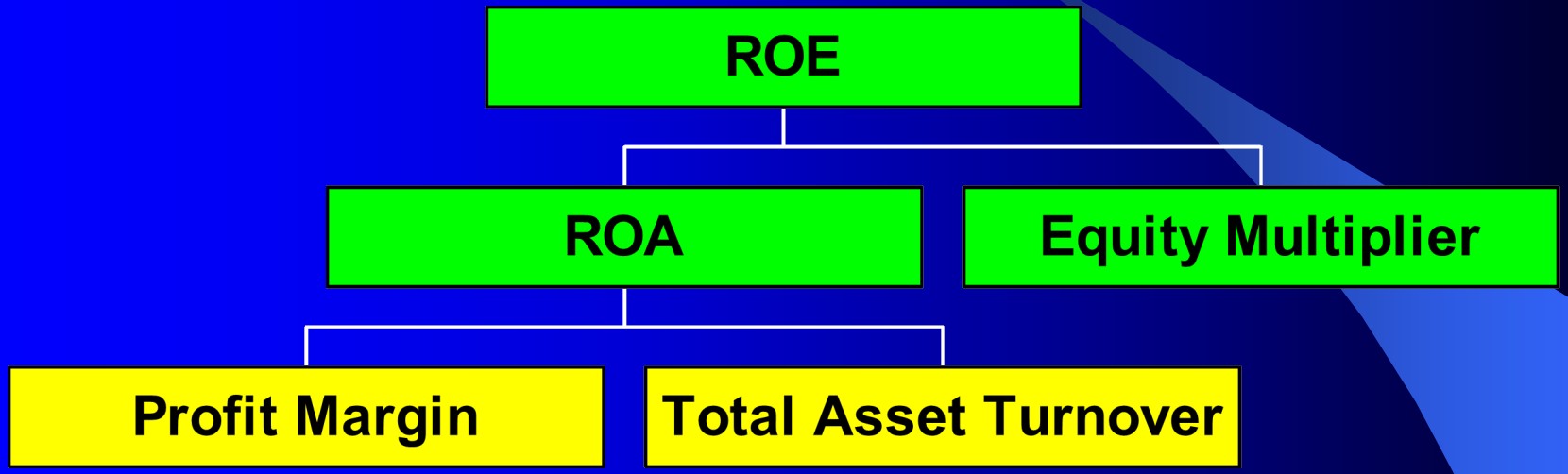
The DuPont System

- Method to breakdown ROE into:
  - ROA and Equity Multiplier
- ROA is further broken down as:
  - Profit Margin and Asset Turnover
- Helps to identify sources of strength and weakness in current performance
- Helps to focus attention on value drivers

The DuPont System



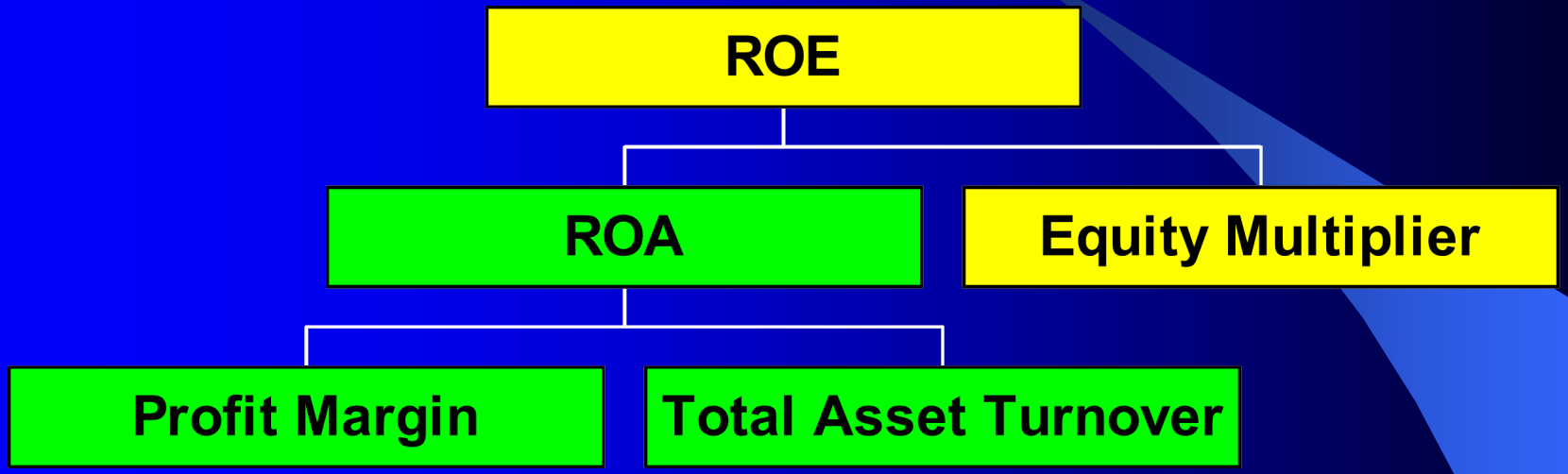
The DuPont System



$$\text{ROE} = \text{ROA} \times \text{Equity Multiplier}$$

$$= \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}}$$

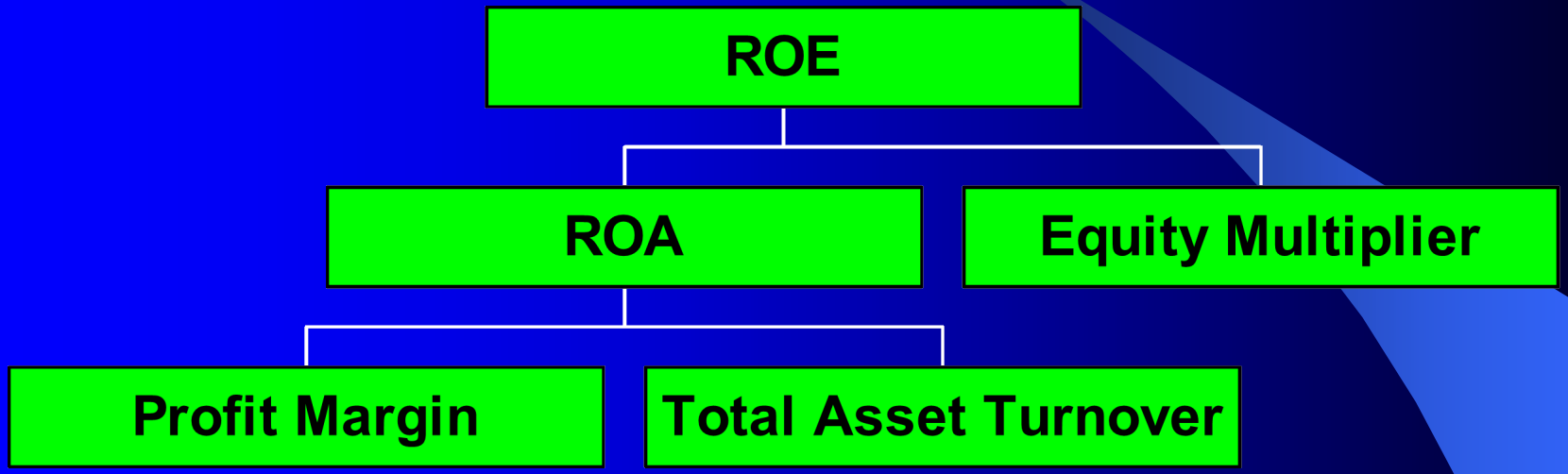
The DuPont System



$$\text{ROA} = \text{Profit Margin} \times \text{Total Asset Turnover}$$

$$= \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$$

The DuPont System



$$\text{ROE} = \text{Profit Margin} \times \text{Total Asset Turnover} \times \text{Equity Multiplier}$$

$$= \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}}$$

The DuPont System: Dell

$$\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Equity}}$$

$$= \text{Profit Margin} \times \text{Total Asset Turnover} \times \text{Equity Multiplier}$$

$$= \text{ROA} \times \text{Equity Multiplier}$$

$$\text{ROE} = \frac{\$1{,}666.00}{\$25{,}265.00} \times \frac{\$25{,}265.00}{\$11{,}471.00} \times \frac{\$11{,}471.00}{\$5{,}308.00}$$

$$= 0.0659 \times 2.2025 \times 2.1611$$

$$= 0.1452 \times 2.1611$$

$$= 31.39\%$$

A Note on Sustainable Growth and Stock Returns

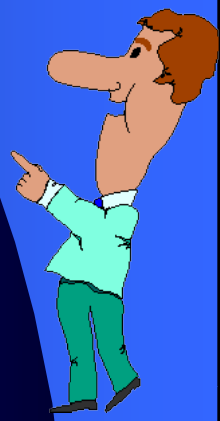
- **In the long run**
  - **Sustainable growth and long run capital gains (g) = ROE x r**
- **Recall the relationship between stock returns (r), capital gains (g) and forward dividend yields (D_1/P_0):**
  - $r = g + D_1/P_0 = g + D_o(1+g)/P_0$
- **Note: r & g must be quarterly if D is quarterly and annual if D is annual**

Example: Predicted Sustainable Growth for Dell

- **Based on the most recent numbers:**
  - **ROE = 31.39% & r = 100%**
  - **g = 0.3139 x 1 = 31.39%**
  - **r = 0.3139 + 0/P = 31.39%**
- **Based on 5 year averages:**
  - **ROE = 51.94% & r = 100%**
  - **g = 0.5194 x 1 = 51.94%**
  - **r = 0.3139 + 0/P = 51.94%**

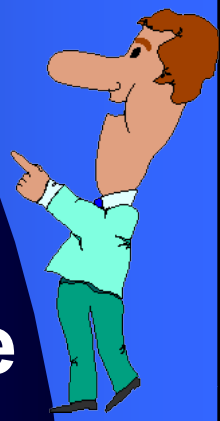
Summary of Financial Ratios

- Ratios help to:
  - Evaluate performance
  - Structure analysis
  - Show the connection between activities and performance
- Benchmark with
  - Past for the company
  - Industry
- Ratios adjust for size differences



Limitations of Ratio Analysis

- A firm's industry category is often difficult to identify
- Published industry averages are only guidelines
- Accounting practices differ across firms
- Sometimes difficult to interpret deviations in ratios
- Industry ratios may not be desirable targets
- Seasonality affects ratios



Ratios and Forecasting

- **Common stock valuation based on**
  - **Expected cashflows to stockholders**
  - **ROE and r are major determinants of cashflows to stockholders**
- **Ratios influence expectations by:**
  - **Showing where firm is now**
  - **Providing context for current performance**
- **Current information influences expectations by:**
  - **Showing developments that will alter future performance**

How Might Ratios Help Me on the IEM?

- **Analysis of AAPL, IBM and MSFT, and comparisons to the S&P500 companies can help to:**
  - **Assess the (absolute and relative) financial state of each company**
  - **Show each company's strengths and weaknesses**
  - **Predict sustainable growth rate**
- **Combined with current information, this can help to:**
  - **Assess likely future performance**
  - **Predict future valuation and earnings growth**
  - **Predict returns**

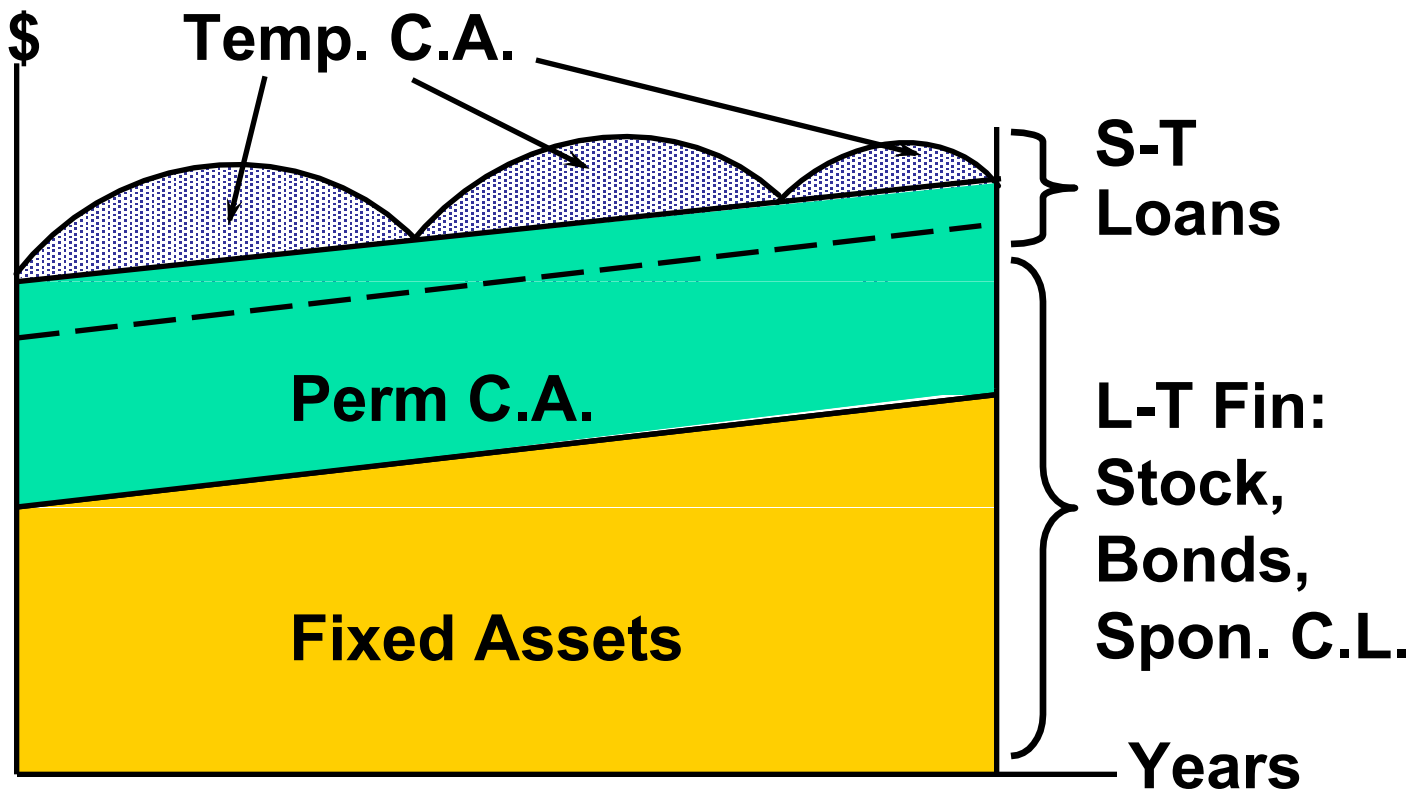
CHAPTER 16
Financing Current Assets

- Working capital financing policies
- A/P (trade credit)
- Commercial paper
- S-T bank loans

Working capital financing policies

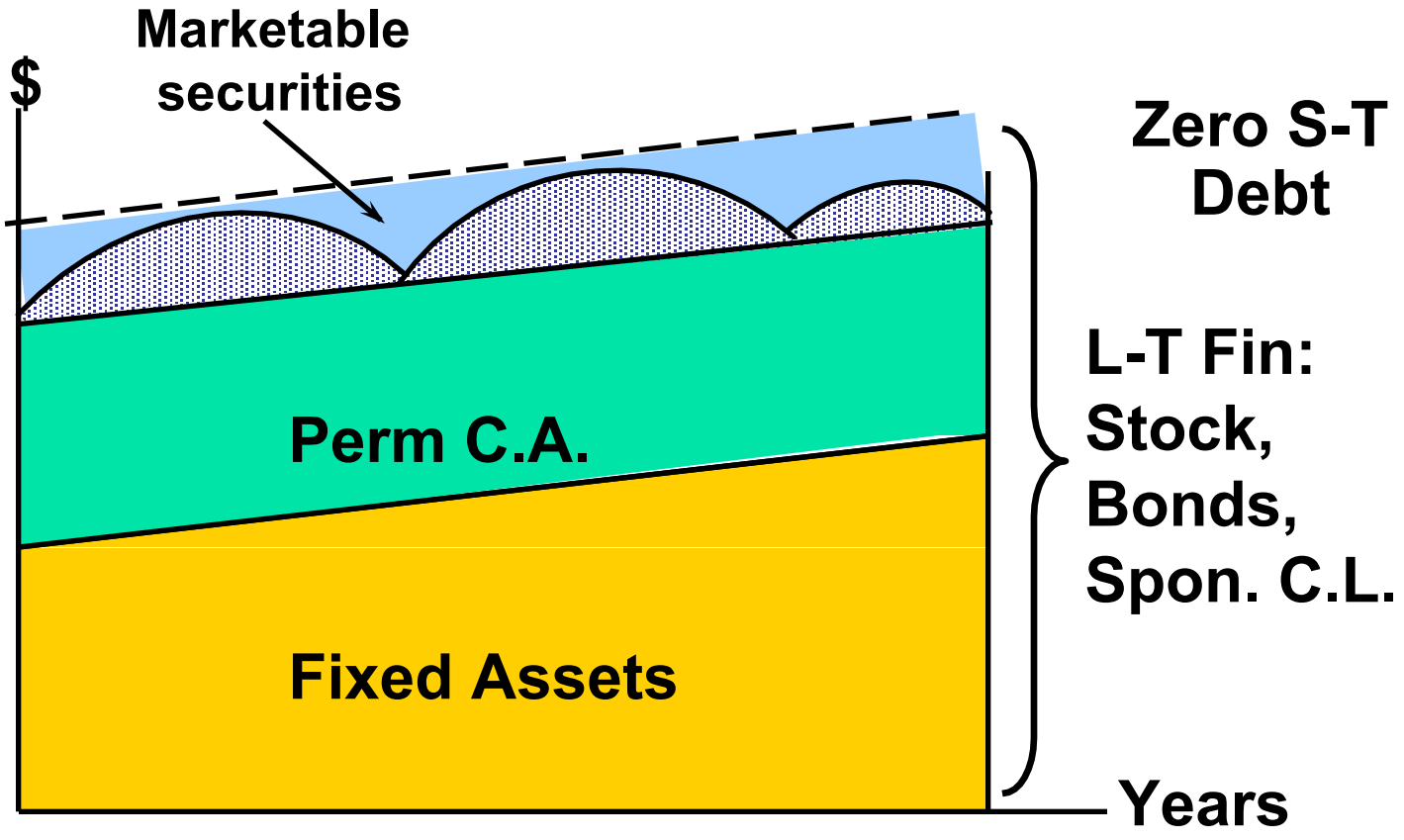
- Moderate – Match the maturity of the assets with the maturity of the financing.
- Aggressive – Use short-term financing to finance permanent assets.
- Conservative – Use permanent capital for permanent assets and temporary assets.

Moderate financing policy



Lower dashed line would be more aggressive.

Conservative financing policy



Short-term credit

- Any debt scheduled for repayment within one year.
- Major sources of short-term credit
  - Accounts payable (trade credit)
  - Bank loans
  - Commercial loans
  - Accruals
- From the firm's perspective, S-T credit is more risky than L-T debt.
  - Always a required payment around the corner.
  - May have trouble rolling over loans.

Advantages and disadvantages of using short-term financing

- Advantages
  - Speed
  - Flexibility
  - Lower cost than long-term debt
- Disadvantages
  - Fluctuating interest expense
  - Firm may be at risk of default as a result of temporary economic conditions

Accrued liabilities

- Continually recurring short-term liabilities, such as accrued wages or taxes.
- Is there a cost to accrued liabilities?
  - They are free in the sense that no explicit interest is charged.
  - However, firms have little control over the level of accrued liabilities.

What is trade credit?

- Trade credit is credit furnished by a firm's suppliers.
- Trade credit is often the largest source of short-term credit, especially for small firms.
- Spontaneous, easy to get, but cost can be high.

The cost of trade credit

- A firm buys $3,000,000 net ($3,030,303 gross) on terms of 1/10, net 30.
- The firm can forego discounts and pay on Day 40, without penalty.

Net daily purchases = $3,000,000 / 365

= $8,219.18

Breaking down net and gross expenditures

- Firm buys goods worth $3,000,000. That's the cash price.
- They must pay $30,303 more if they don't take discounts.
- Think of the extra $30,303 as a financing cost similar to the interest on a loan.
- Want to compare that cost with the cost of a bank loan.

Breaking down trade credit

- Payables level, if the firm takes discounts
  - Payables = $8,219.18 (10) = $82,192
- Payables level, if the firm takes no discounts
  - Payables = $8,219.18 (40) = $328,767
- Credit breakdown

Total trade credit	$328,767
Free trade credit	- 82,192
Costly trade credit	$246,575

Nominal cost of costly trade credit

- The firm loses 0.01($3,030,303) = $30,303 of discounts to obtain $246,575 in extra trade credit:

$$k_{NOM} = \$30,303 / \$246,575$$
$$= 0.1229 = 12.29\%$$

- The $30,303 is paid throughout the year, so the effective cost of costly trade credit is higher.

Nominal trade credit cost formula

$$k_{NOM} = \frac{\text{Discount \%}}{1 - \text{Discount \%}} \times \frac{365 \text{ days}}{\text{Days taken} - \text{Disc. period}}$$

$$= \frac{1}{99} \times \frac{365}{40 - 10}$$

$$= 0.1229$$

$$= 12.29\%$$

Effective cost of trade credit

- Periodic rate = 0.01 / 0.99 = 1.01%
- Periods/year = 365 / (40-10) = 12.1667
- Effective cost of trade credit
  - EAR = $(1 + \text{periodic rate})^{n} - 1$

    $= (1.0101)^{12.1667} - 1 = 13.01\%$

Commercial paper (CP)

- Short-term notes issued by large, strong companies. B&B couldn't issue CP--it's too small.
- CP trades in the market at rates just above T-bill rate.
- CP is bought with surplus cash by banks and other companies, then held as a marketable security for liquidity purposes.

Bank loans

- The firm can borrow $100,000 for 1 year at an 8% nominal rate.
- Interest may be set under one of the following scenarios:
  - Simple annual interest
  - Discount interest
  - Discount interest with 10% compensating balance
  - Installment loan, add-on, 12 months

Must use the appropriate EARs to evaluate the alternative loan terms

- Nominal (quoted) rate = 8% in all cases.
- We want to compare loan cost rates and choose lowest cost loan.
- We must make comparison on EAR = Equivalent (or Effective) Annual Rate basis.

Simple annual interest

- "Simple interest" means no discount or add-on.

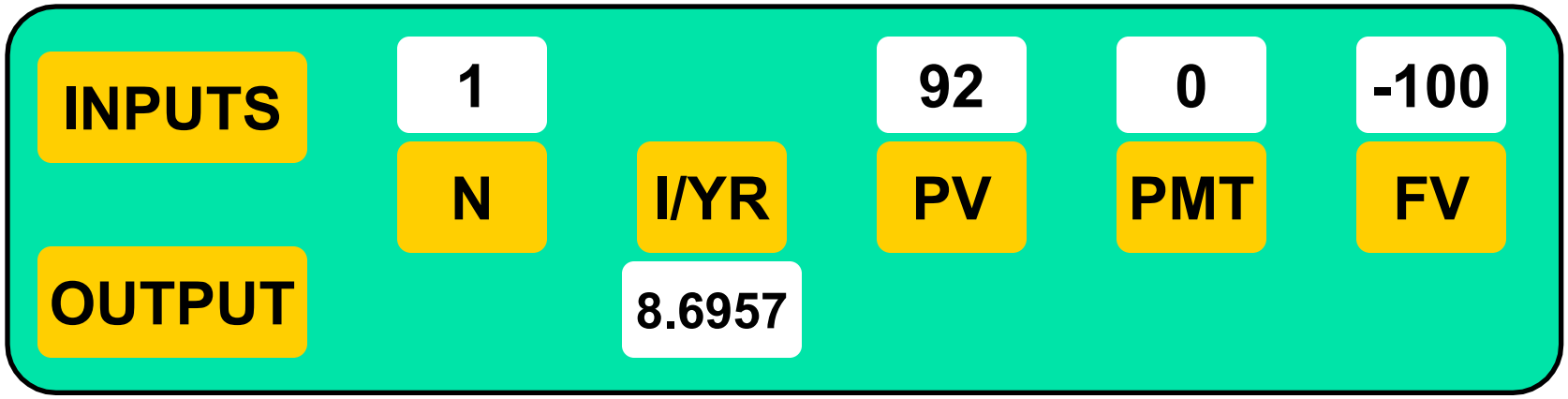
Interest = 0.08($100,000) = $8,000

k_{NOM} = EAR = $8,000 / $100,000 = 8.0%

For a 1-year simple interest loan, k_{NOM} = EAR

Discount interest

- Deductible interest = 0.08 ($100,000)
  = $8,000
- Usable funds = $100,000 - $8,000
  = $92,000



Raising necessary funds with a discount interest loan

- Under the current scenario, $100,000 is borrowed but $8,000 is forfeited because it is a discount interest loan.
- Only $92,000 is available to the firm.
- If $100,000 of funds are required, then the amount of the loan should be:

Amt borrowed = Amt needed / (1 – discount)

= $100,000 / 0.92 = $108,696

Discount interest loan with a 10% compensating balance

$$\text{Amount borrowed} = \frac{\text{Amount needed}}{1 - \text{discount} - \text{comp. balance}}$$

$$= \frac{\$100{,}000}{1 - 0.08 - 0.1} = \$121{,}951$$

- Interest = 0.08 ($121,951) = $9,756
- Effective cost = $9,756 / $100,000 = 9.756%

Add-on interest on a 12-month installment loan

- Interest = 0.08 ($100,000) = $8,000
- Face amount = $100,000 + $8,000 = $108,000
- Monthly payment = $108,000/12 = $9,000
- Avg loan outstanding = $100,000/2 = $50,000
- Approximate cost = $8,000/$50,000 = 16.0%
- To find the appropriate effective rate, recognize that the firm receives $100,000 and must make monthly payments of $9,000. This constitutes an annuity.

Installment loan

From the calculator output below, we have:

k_{NOM} = 12 (0.012043)
= 0.1445 = 14.45%

EAR = $(1.012043)^{12} - 1$ = 15.45%

INPUTS	12		100	-9	0
	N	I/YR	PV	PMT	FV
OUTPUT		1.2043			

What is a secured loan?

- In a secured loan, the borrower pledges assets as collateral for the loan.
- For short-term loans, the most commonly pledged assets are receivables and inventories.
- Securities are great collateral, but generally not available.

Inventory Management

What is inventory?

Inventory is the raw materials, component parts, work-in-process, or finished products that are held at a location in the

Why do we care?

At the macro

Inventory is one of the biggest corporate assets ($

Investment in inventory is currently over $1.25 Trillion (U.S. Department of Commerce).

This figure accounts for almost 25% of GNP.

Enormous potential for efficiency increase by controlling inventories

Why do we care?

At the firm level:

- Sales growth: right inventory at the right place at the right time
- Cost reduction: less money tied up in inventory, inventory management, obsolescence

Higher profit

Why do we care?

Each of Solectron's big customers, which include Cisco, Ericsson, and Lucent was expecting explosive growth for wireless phones and networking gear….when the bottom finally fell out, it was too late for Solectron to halt orders from all of its 4,000 suppliers. Now, Solectron has $4.7 billion in inventory. (BW, March 19, 2001)

"When Palm formally reported its quarterly numbers in June, the damage was gruesome. Its loss totaled $392 million, a big chunk of which was attributable to writing down excess inventory - piles of unsold devices." (*The Industry Standard*, June 16, 2001)

"Liz Claiborne said its unexpected earnings decline is the consequence of higher than anticipated excess inventories". (WSJ, August 1993)

How do **you** manage your inventory?
How much do you buy? When?

- Soda
- Milk
- Toilet paper
- Gas
- Cereal
- Cash

What Do you Consider?

- Cost of not having it.
- Cost of going to the grocery or gas station (time, money), cost of drawing money.
- Cost of holding and storing, lost interest.
- Price discounts.
- How much you consume.
- Some safety against uncertainty.

Costs of Inventory

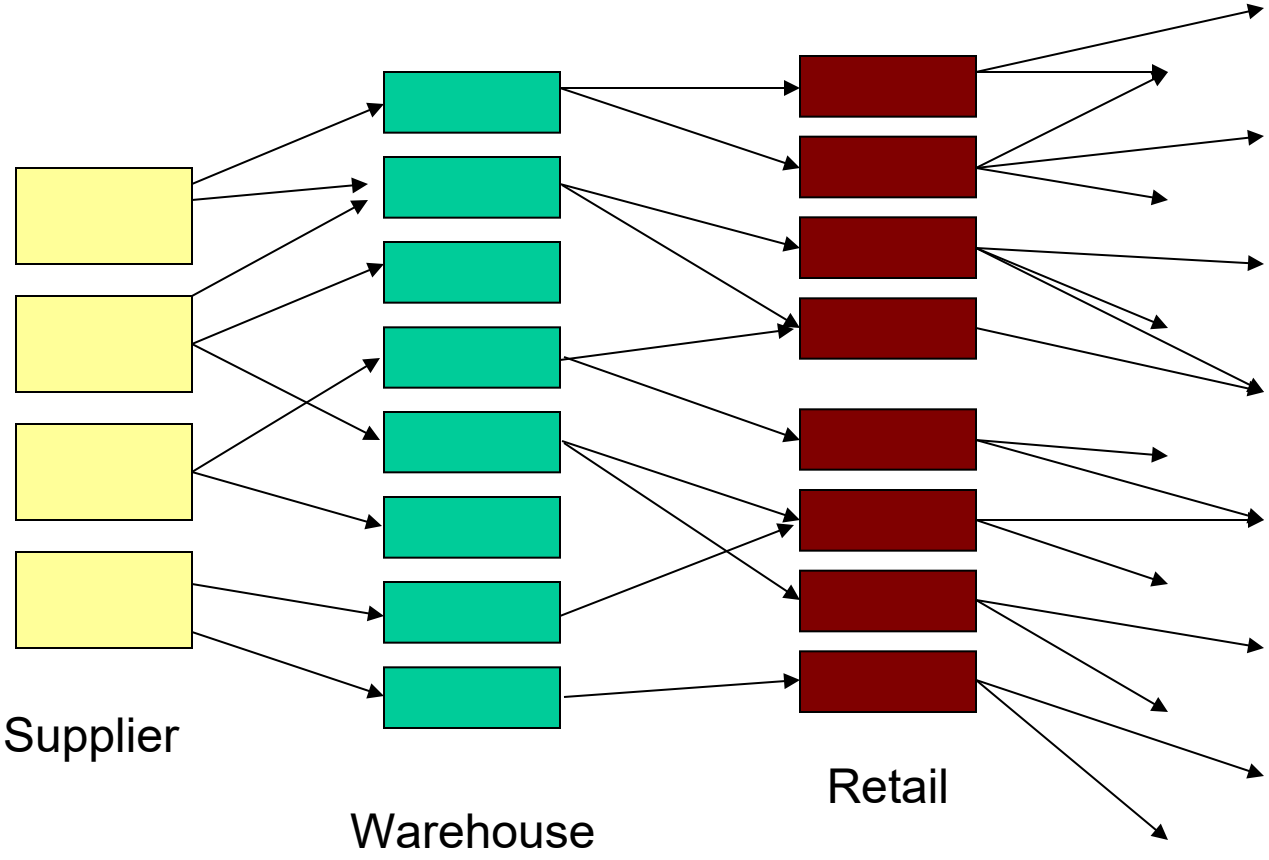
- Physical holding costs:
  - out of pocket expenses for storing inventory (insurance, security, warehouse rental, cooling)
  - All costs that may be entailed before you sell it (obsolescence, spoilage, rework...)
- Opportunity cost of inventory: foregone return on the funds invested.
- Operational costs:
  - Delay in detection of quality problems.
  - Delay the introduction of new products.
  - Increase throughput times.

Benefits of Inventory

- Hedge against uncertain demand
- Hedge against uncertain supply
- Economize on ordering costs
- Smoothing

To summarize, we build and keep inventory in order to match supply and demand in the most cost effective way.

Modeling Inventory in a Supply Chain…



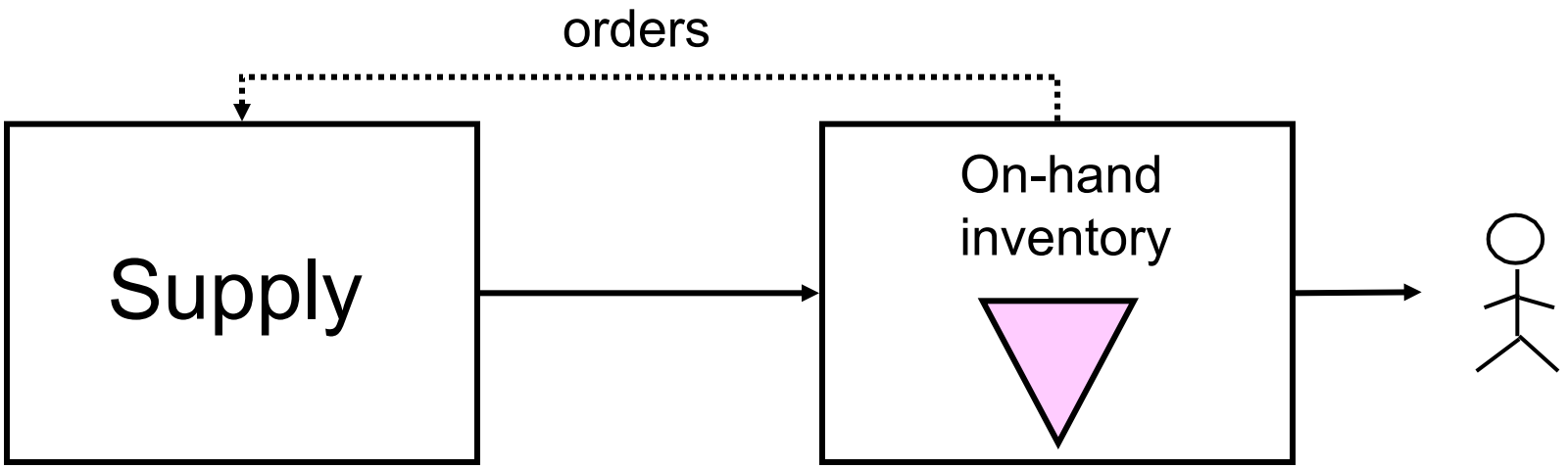
Home Depot

- “Our inventory consists of up to 35,000 different kinds of building materials, home improvement supplies, and lawn and garden products.”
- “We currently offer thousands of products in our online store.”
- “We offer approximately 250,000 more products through our special order services.”

Different types of inventory models

1. Multi-period model
   - Repeat business, multiple orders
2. Single period models
   - Single selling season, single order

Multiperiod model



- Key questions:
  - How often to review?
  - When to place an order?
  - How much to order?
  - How much stock to keep?

- Ordering costs
- Holding costs

Multiperiod model – The Economic Order Quantity

- Demand is known and deterministic: *D* units/year
- We have a known ordering cost, *S*, and immediate replenishment
- Annual holding cost of average inventory is *H* per unit
- Purchasing cost *C* per unit

What is the optimal quantity to order?

Total Cost = Purchasing Cost + Ordering Cost + Inventory Cost

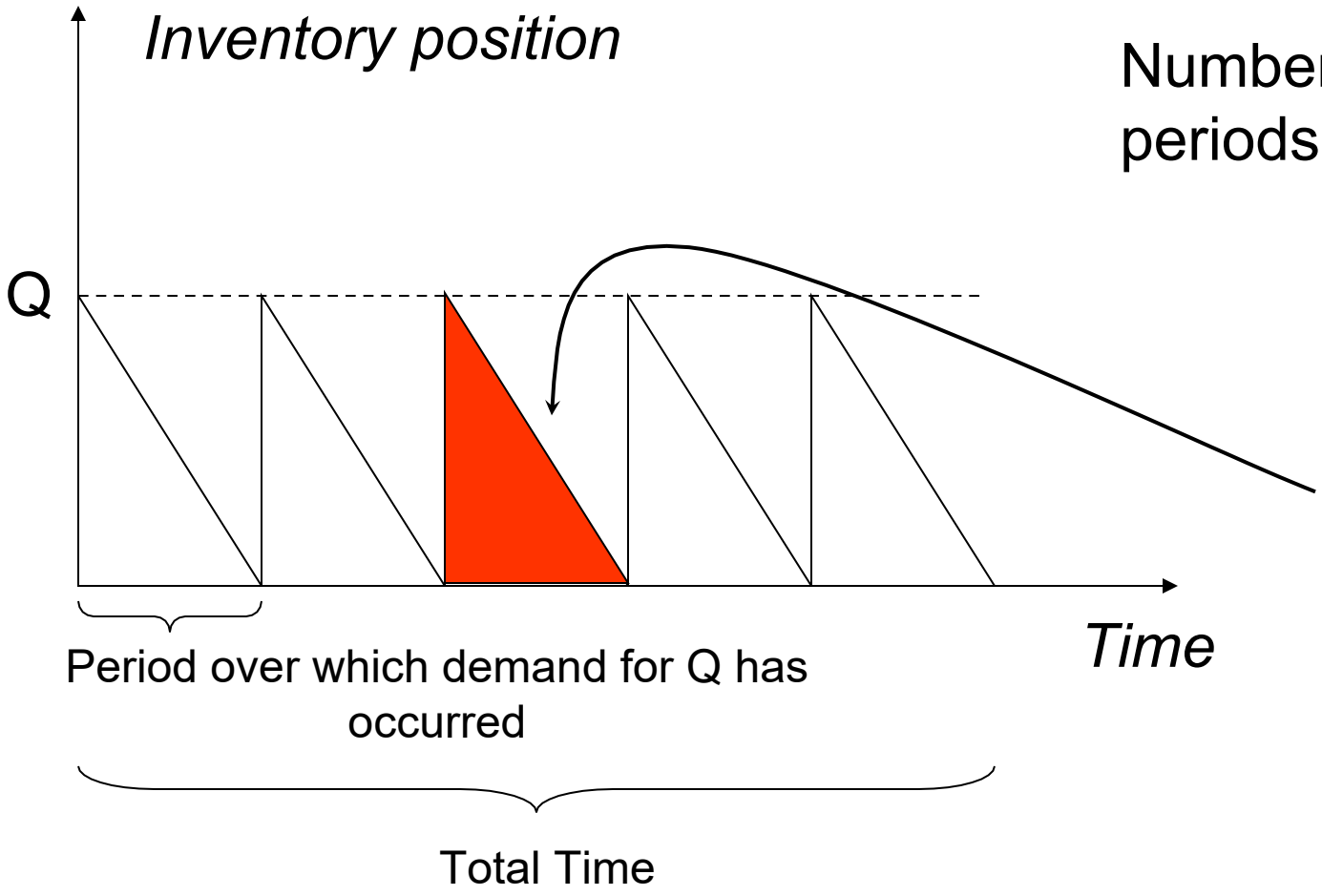
Purchasing Cost = (total units) x (cost per unit)

Ordering Cost = (number of orders) x (cost per order)

Inventory Cost = (average inventory) x (holding cost)

Finding the optimal quantity to order…

Let's say we decide to order in batches of Q…



Number of periods will be $\frac{D}{Q}$

The average inventory for each period is… $\frac{Q}{2}$

Finding the optimal quantity to order…

Purchasing cost = D x C

$$\text{Ordering cost} = \frac{D}{Q} \times S$$

$$\text{Inventory cost} = \frac{Q}{2} \times H$$

So what is the total cost?

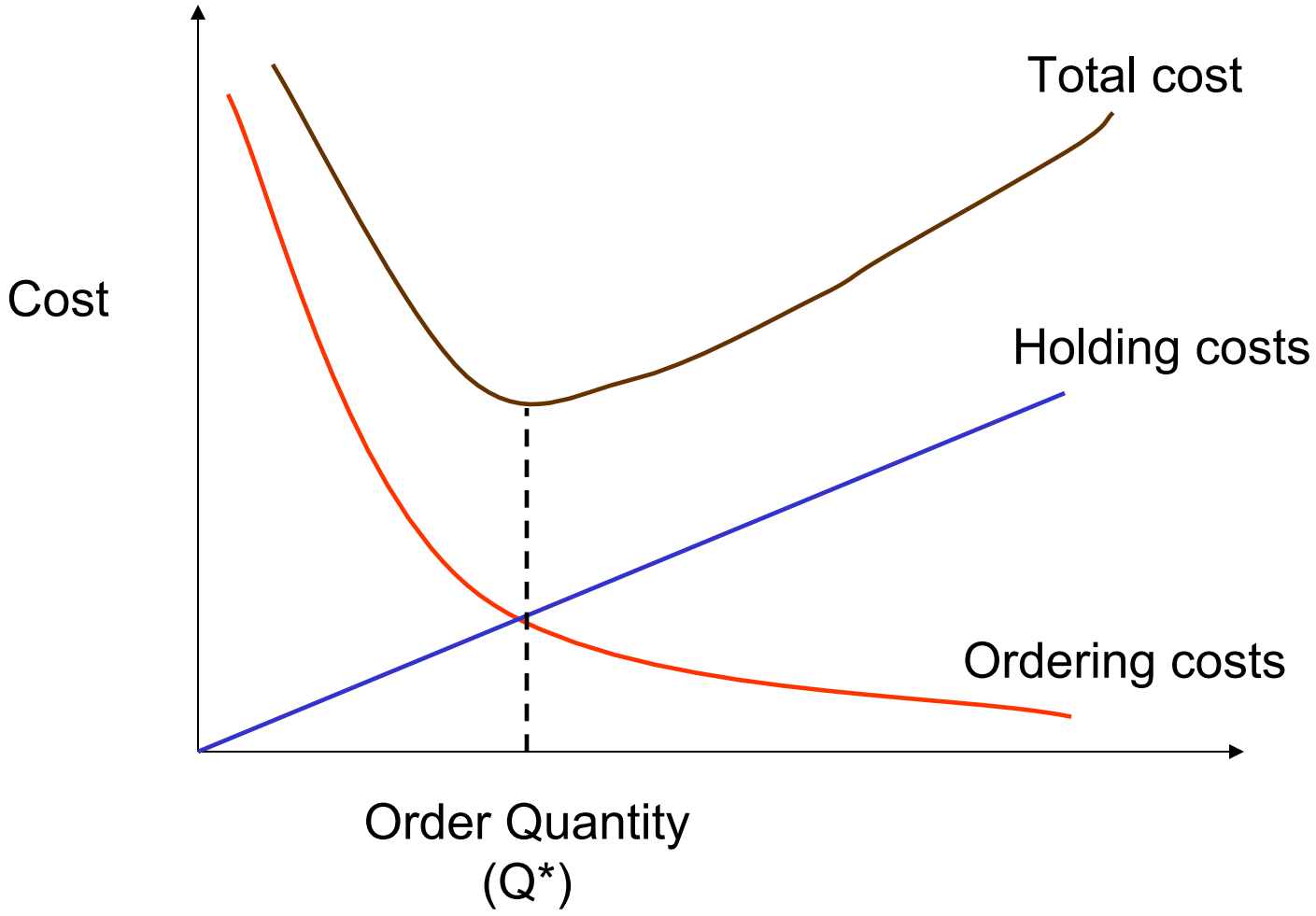
$$TC = D\,C + \frac{D}{Q}\,S + \frac{Q}{2}\,H$$

In order now to find the optimal quantity we need to optimize the total cost with respect to the decision variable (the variable we control)

Which one is the decision variable?

What is the main insight from EOQ?

There is a tradeoff between holding costs and ordering



Economic Order Quantity - EOQ

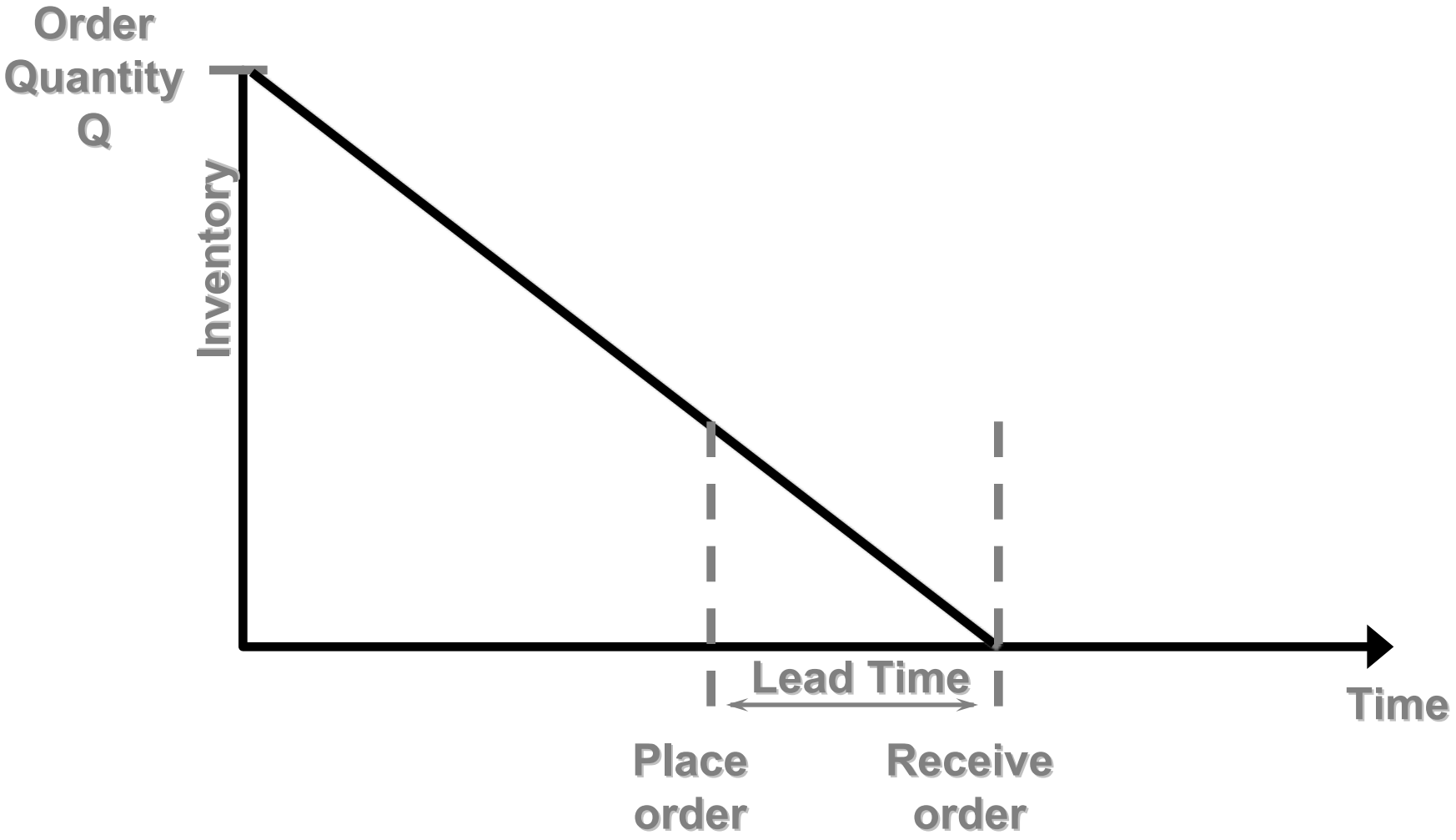
$$Q^* = \sqrt{\frac{2S}{H}}$$

Example:

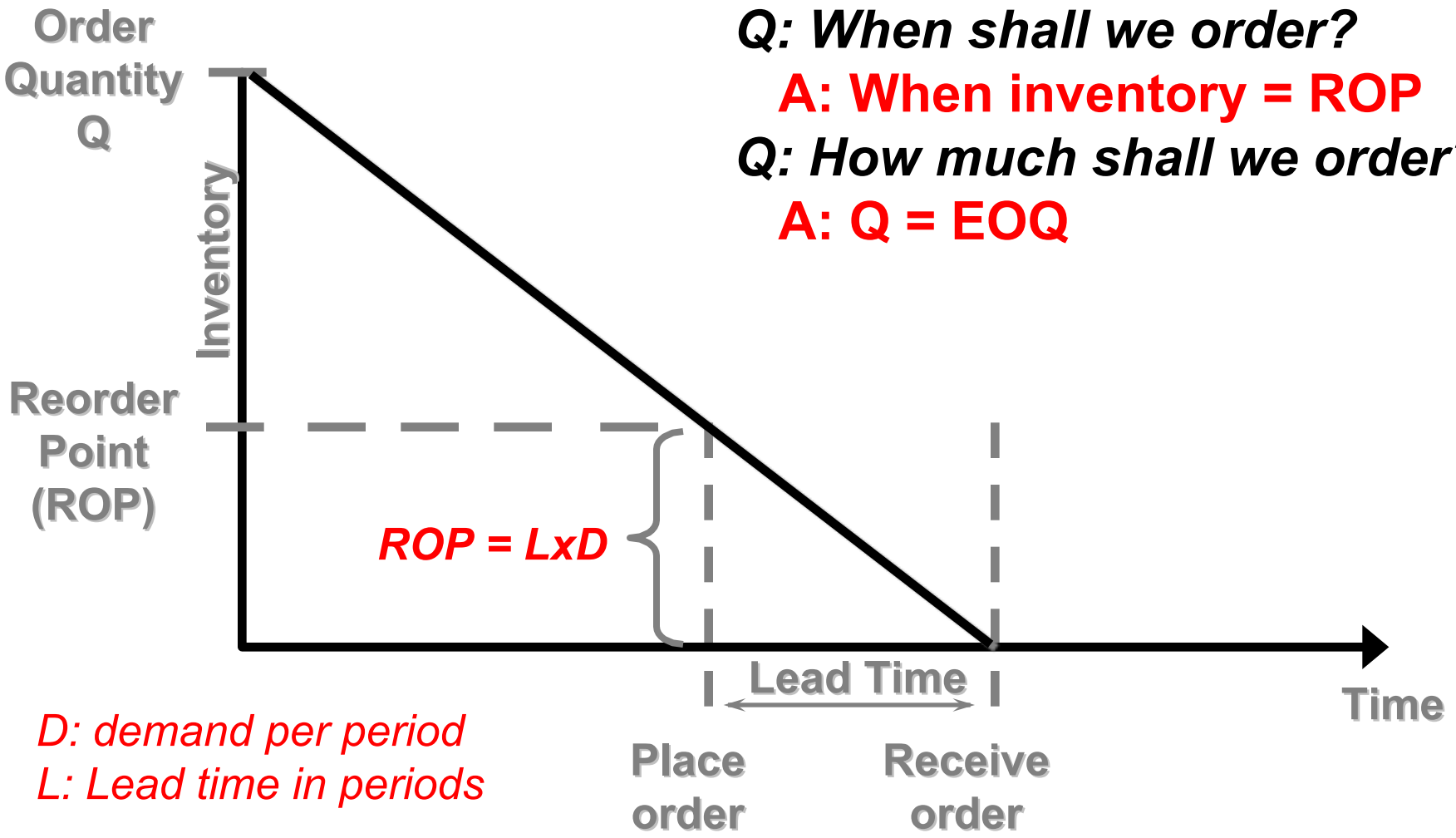
Assume a car dealer that faces demand for 5,000 cars per year, and that it costs $15,000 to have the cars shipped to the dealership. Holding cost is estimated at $500 per car per year. How many times should the dealer order, and what

$$Q^* = \sqrt{\frac{2(15{,}000)(5{,}000)}{500}} = 548$$

If delivery is not instantaneous, but there is a lead time L: When to order? How much to order?



If demand is known exactly, place an order when inventory equals demand during lead time.



Q: When shall we order?

A: When inventory = ROP

Q: How much shall we order?

A: Q = EOQ

Example (continued)…

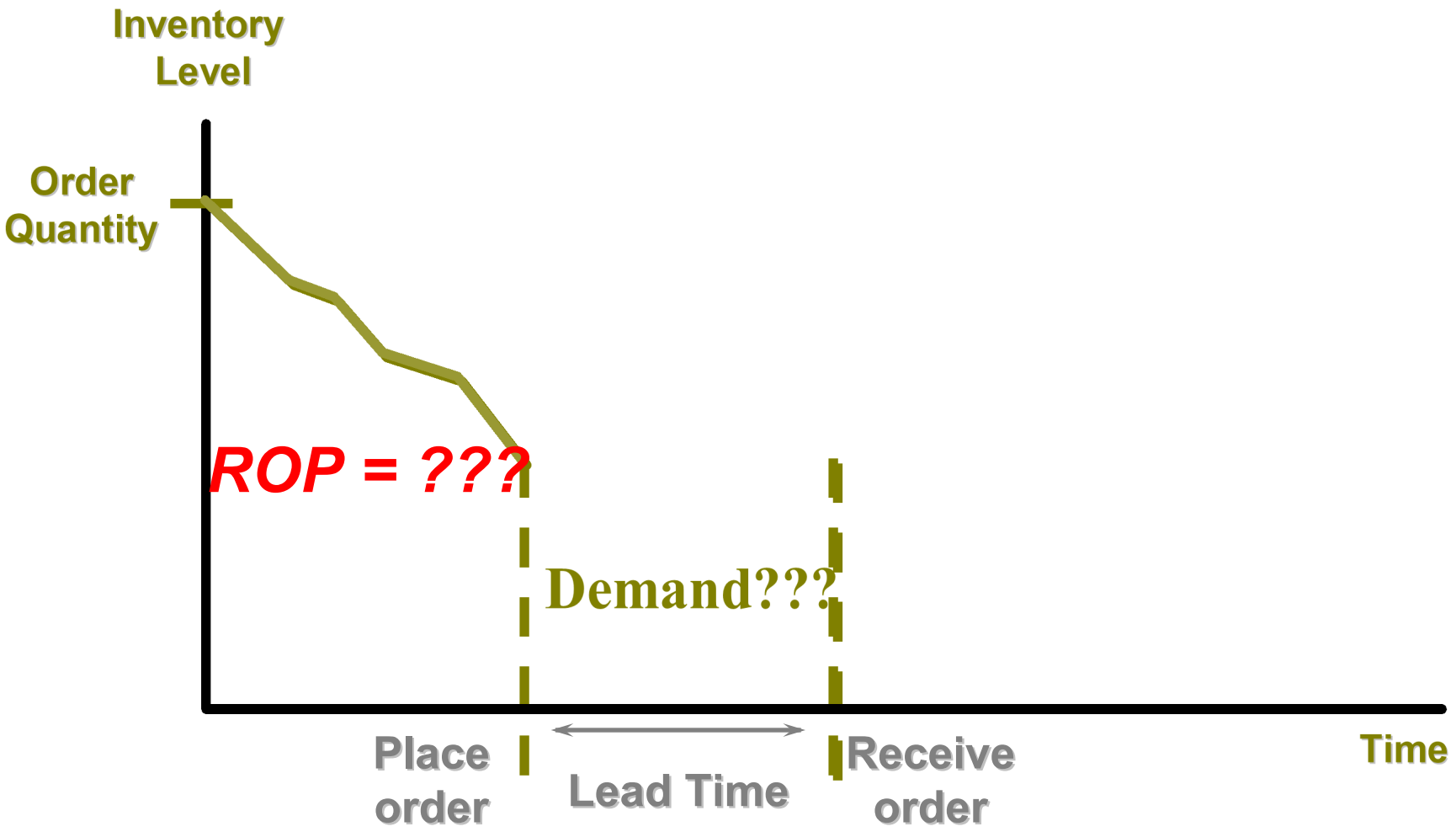
What if the lead time to receive cars is 10 days? (when should you place your order?)

Since D is given in years, first convert: 10 days = 10/365y

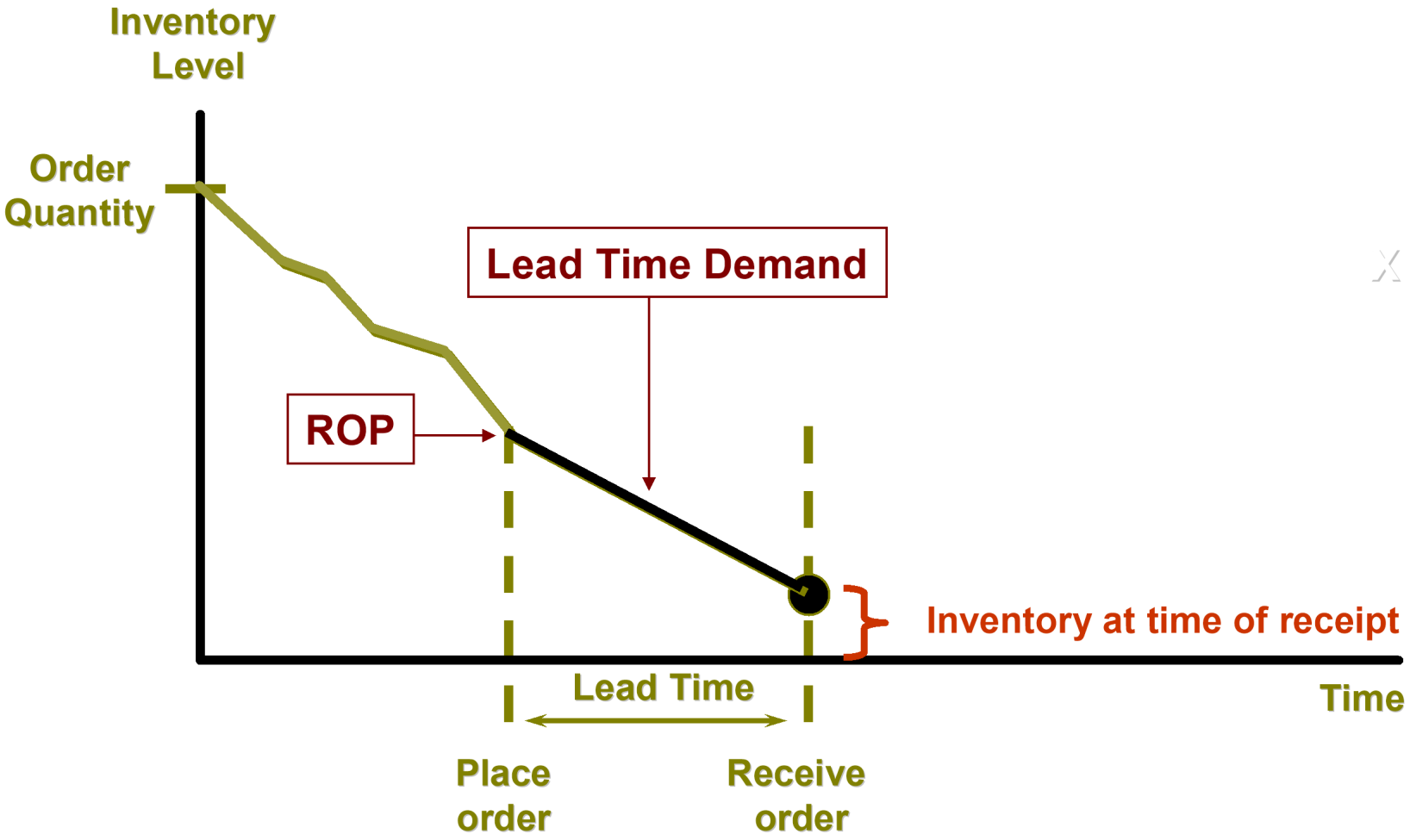
$$R = \frac{10}{365} D = \frac{10}{365} 5000 = 137$$

So, when the number of cars on the lot reaches 137, order 548 more cars.

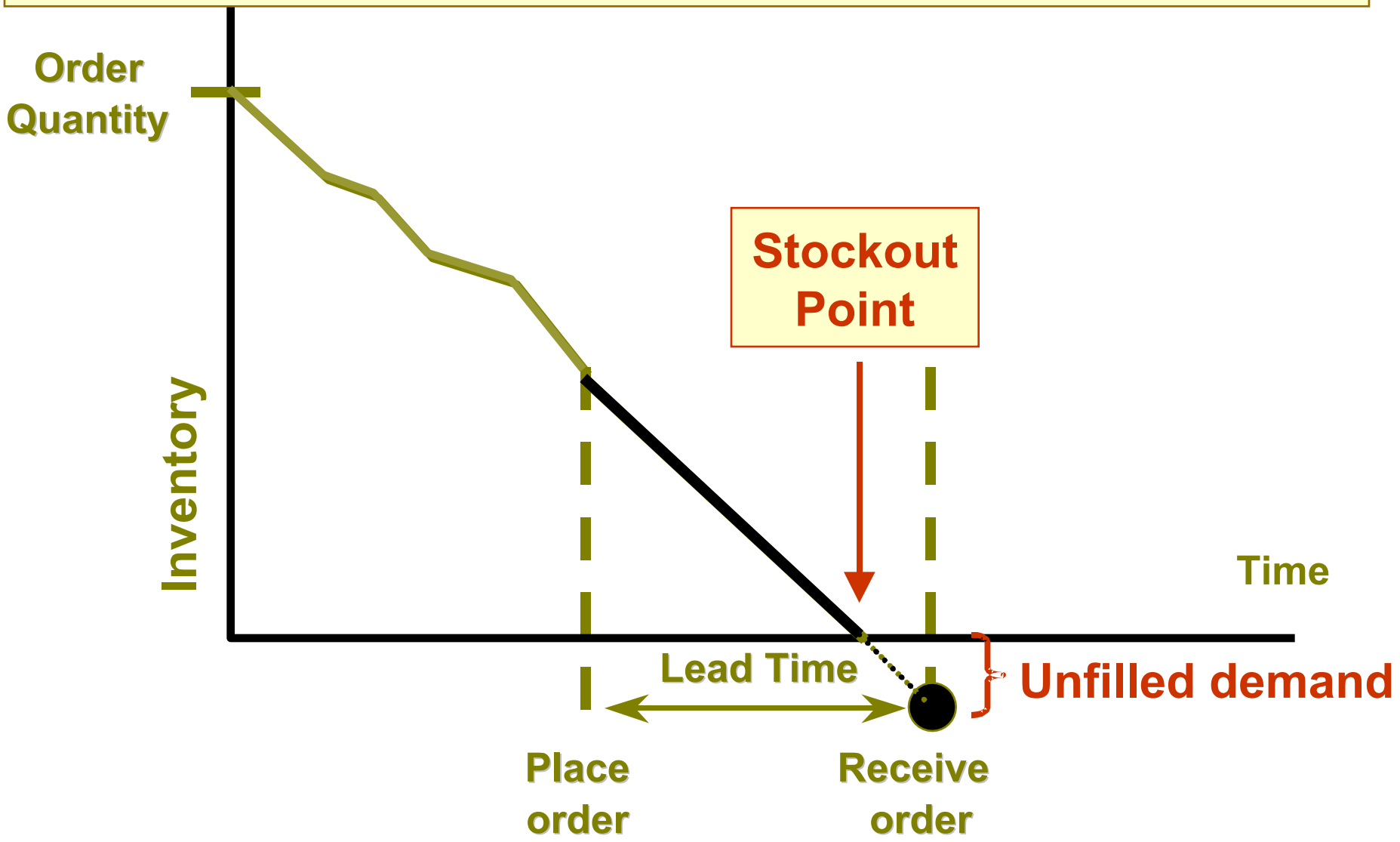
But demand is rarely predictable!



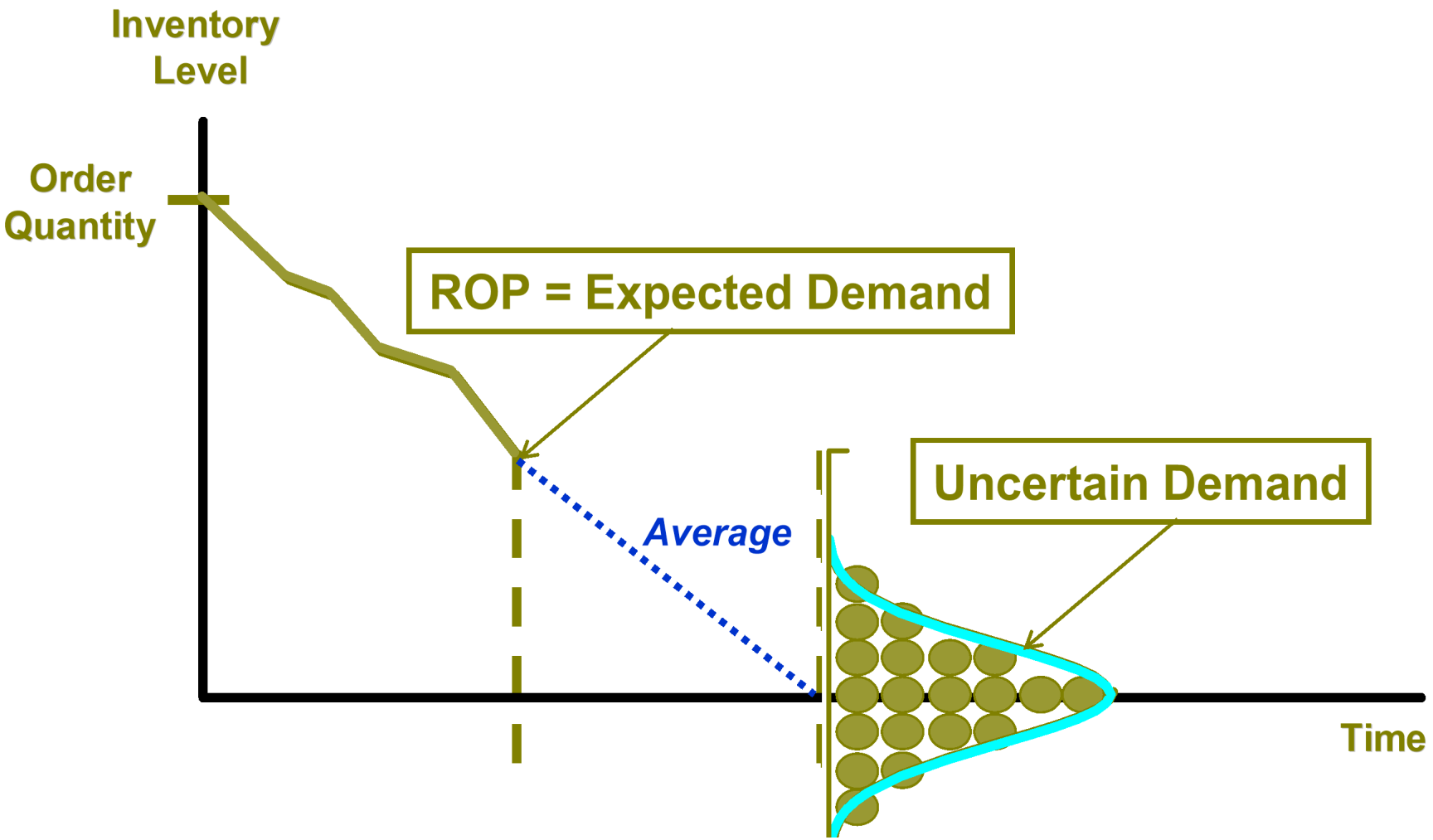
Actual Demand < Expected Demand



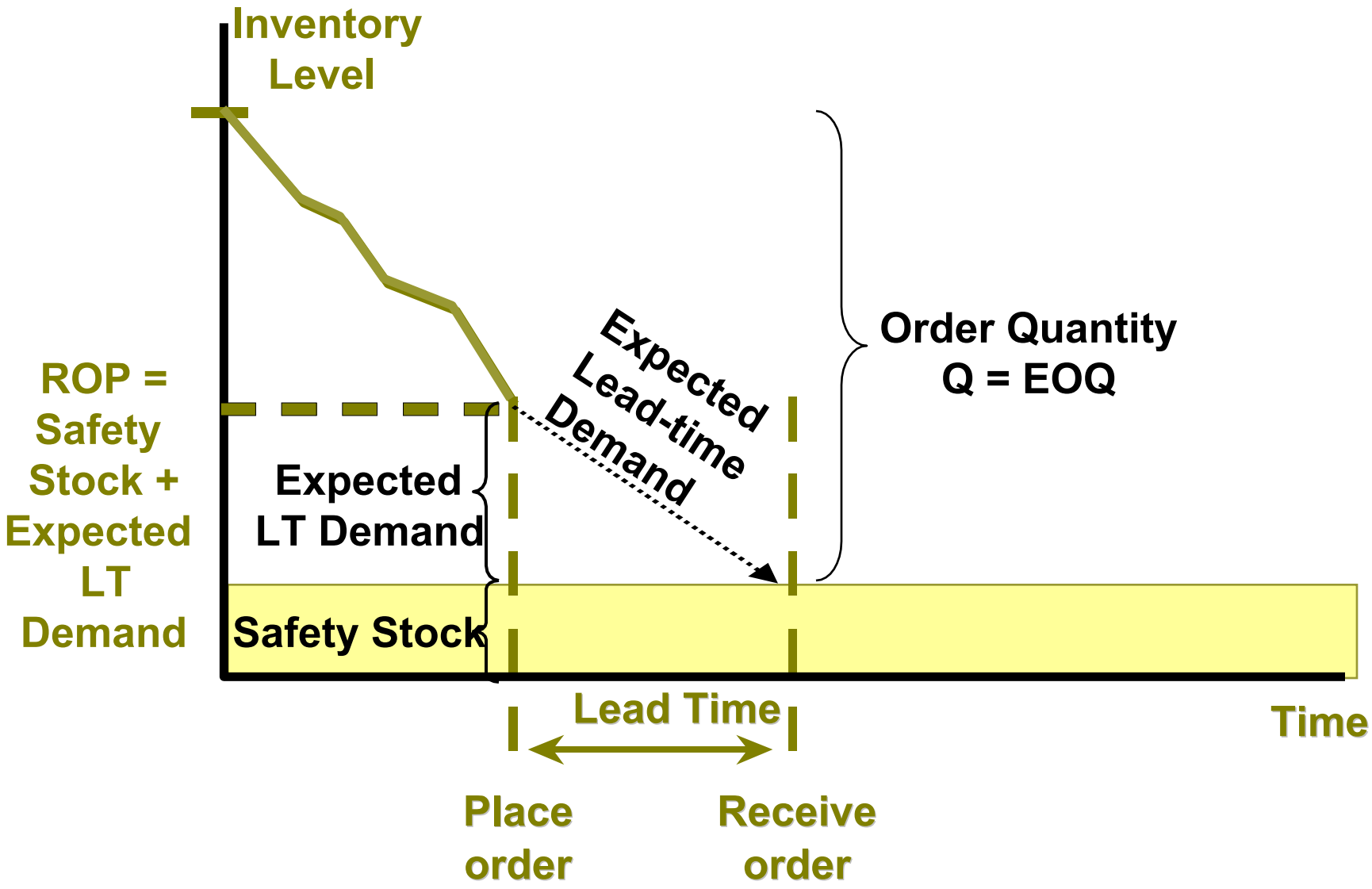
If Actual Demand > Expected, we Stock Out



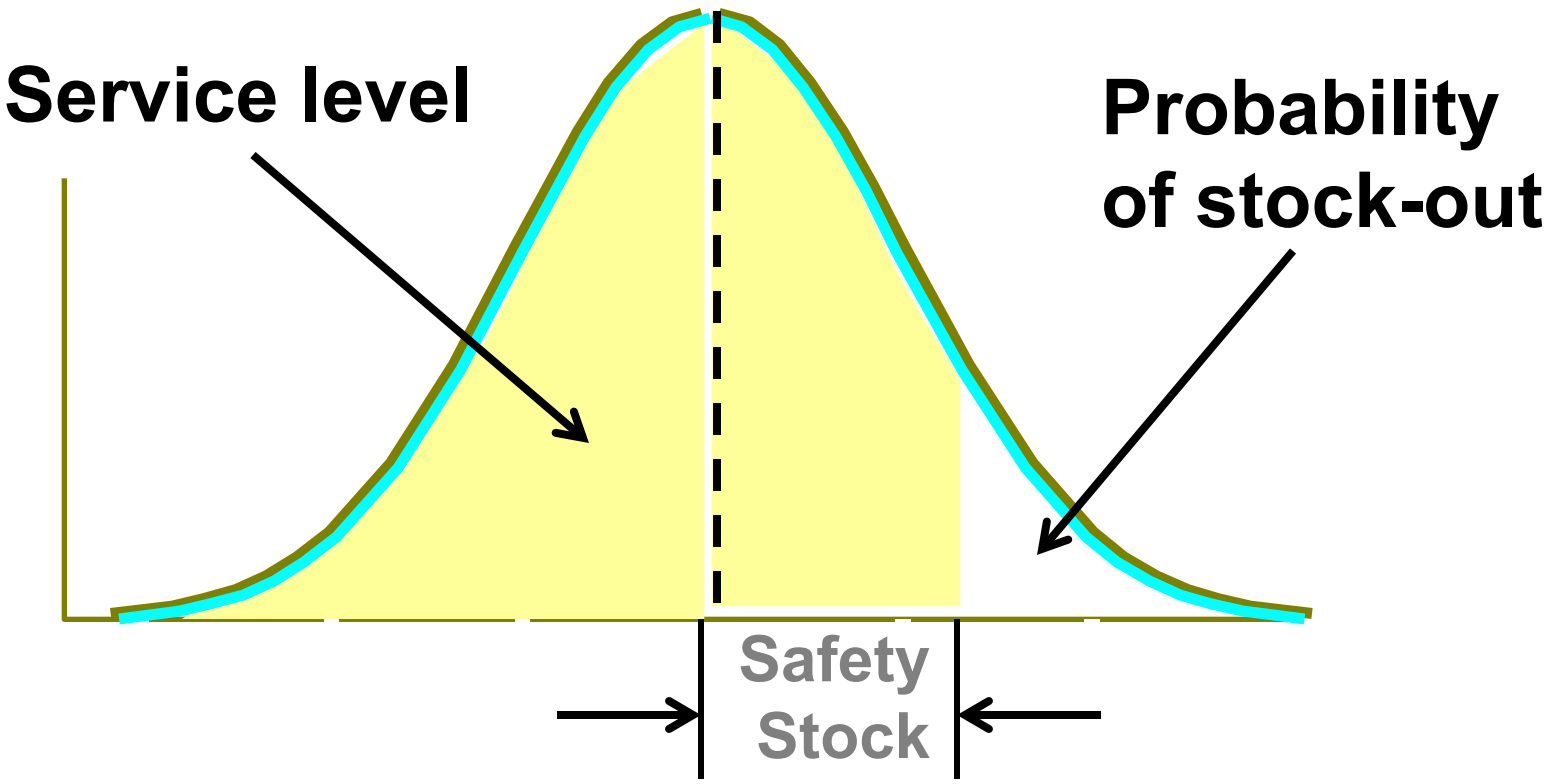
If ROP = expected demand, service level is 50%. Inventory left 50% of the time, stock outs 50% of the time.



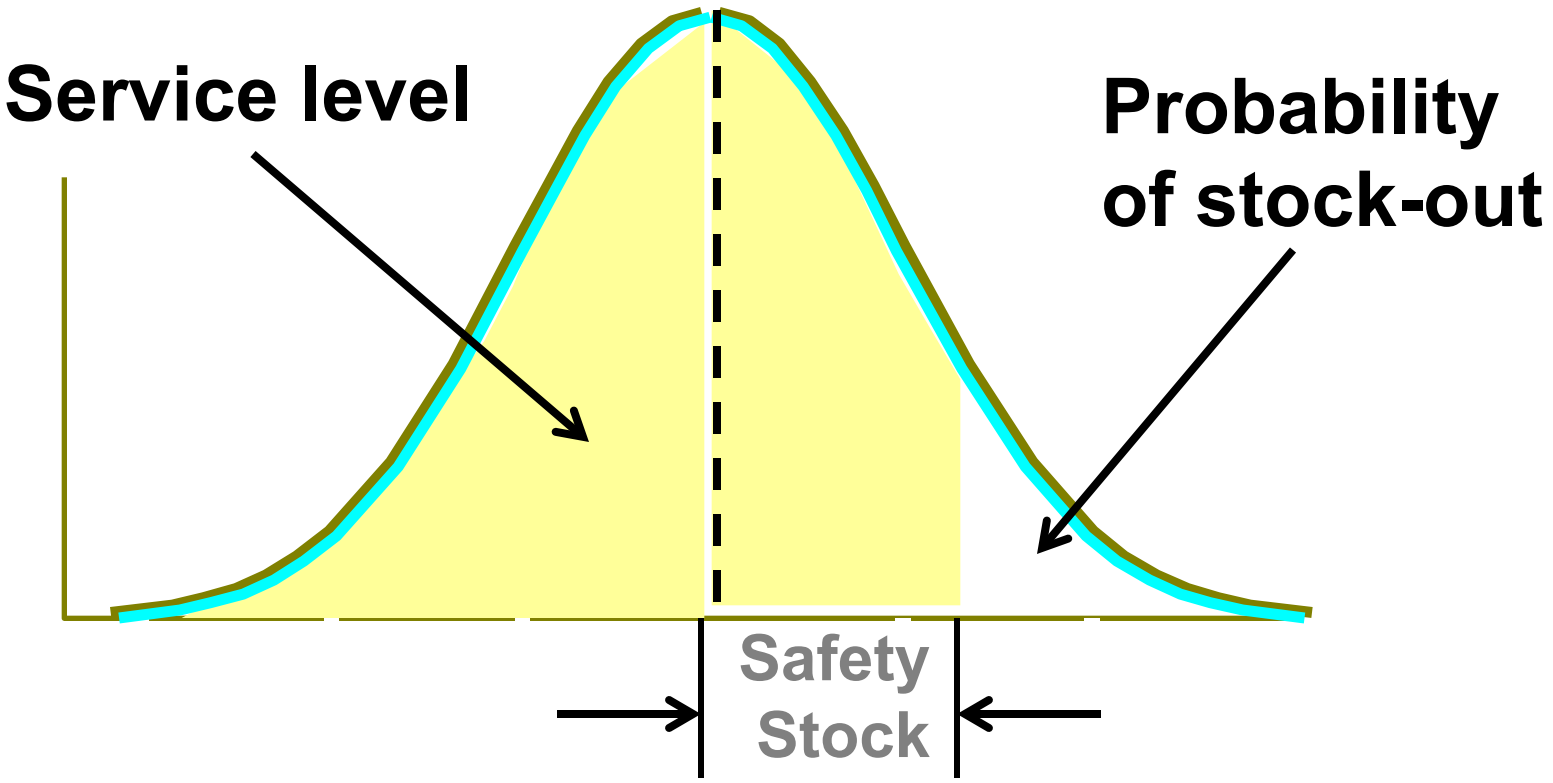
To reduce stockouts we add safety stock



Decide what Service Level you want to provide
(Service level = probability of NOT stocking out



Safety stock = (safety factor z)(std deviation in LT demand)



Read z from Normal table for a given service level

Caution: Std deviation in LT demand

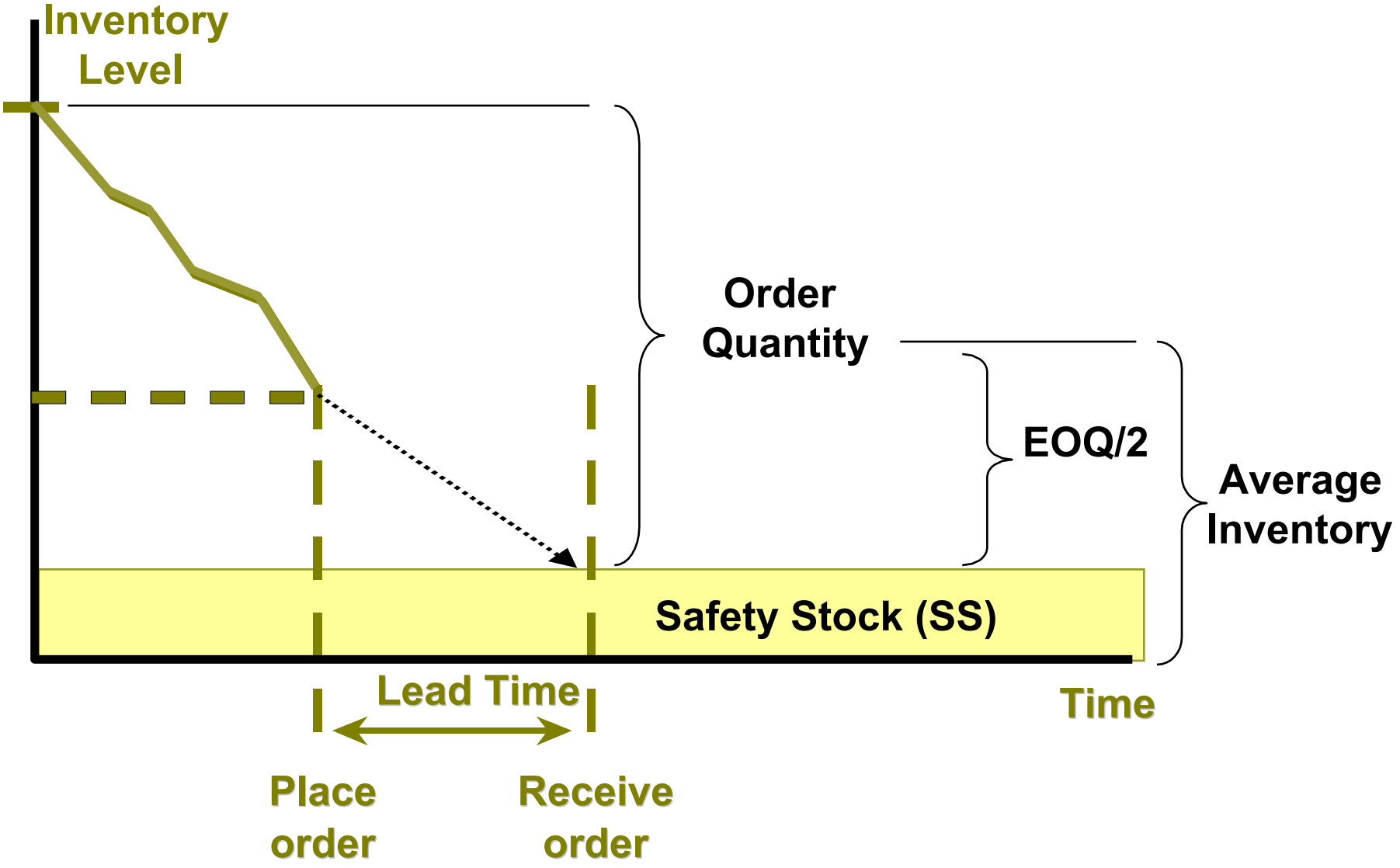
Variance over multiple periods = the sum of

the variances of each period (assuming independence)

Standard deviation over multiple periods is

the square root of the sum of the variances,

Average Inventory = (Order Qty)/2 + Safety Stock



How to find ROP & Q

1. Order quantity Q = $EOQ = \sqrt{\frac{2SD}{H}}$
2. To find ROP, determine the *service level* (i.e., the probability of NOT stocking out.)
   - Find the *safety factor* from a *z*-table or from the graph.
   - Find *std deviation in LT demand: square root law.*

     $$std\ dev\ in\ LT\ demand\ =\ (std\ dev\ in\ daily\ demand\ )\ \sqrt{days\ in\ LT}$$

     $$\sigma_{LT} = \sigma_D \sqrt{LT}$$

   - Safety stock is given by:

     SS = (safety factor)(std dev in LT demand)
   - Reorder point is: *ROP = Expected LT demand + SS*
3. Average Inventory is: *SS + EOQ/2*

Example (continued)…

Back to the car lot… recall that the lead time is 10 days and the expected yearly demand is 5000. You estimate the standard deviation of daily demand demand to be $\sigma_d = 6$. When should you re-order if you want to be 95% sure you don't run out of cars?

Since the expected yearly demand is 5000, the expected demand over the lead time is 5000(10/365) = 137. The z-value corresponding to a service level of 0.95 is 1.65. So

$$ROP = 137 + 1.65\sqrt{10(36)} = 168$$

Order 548 cars when the inventory level drops to 168.