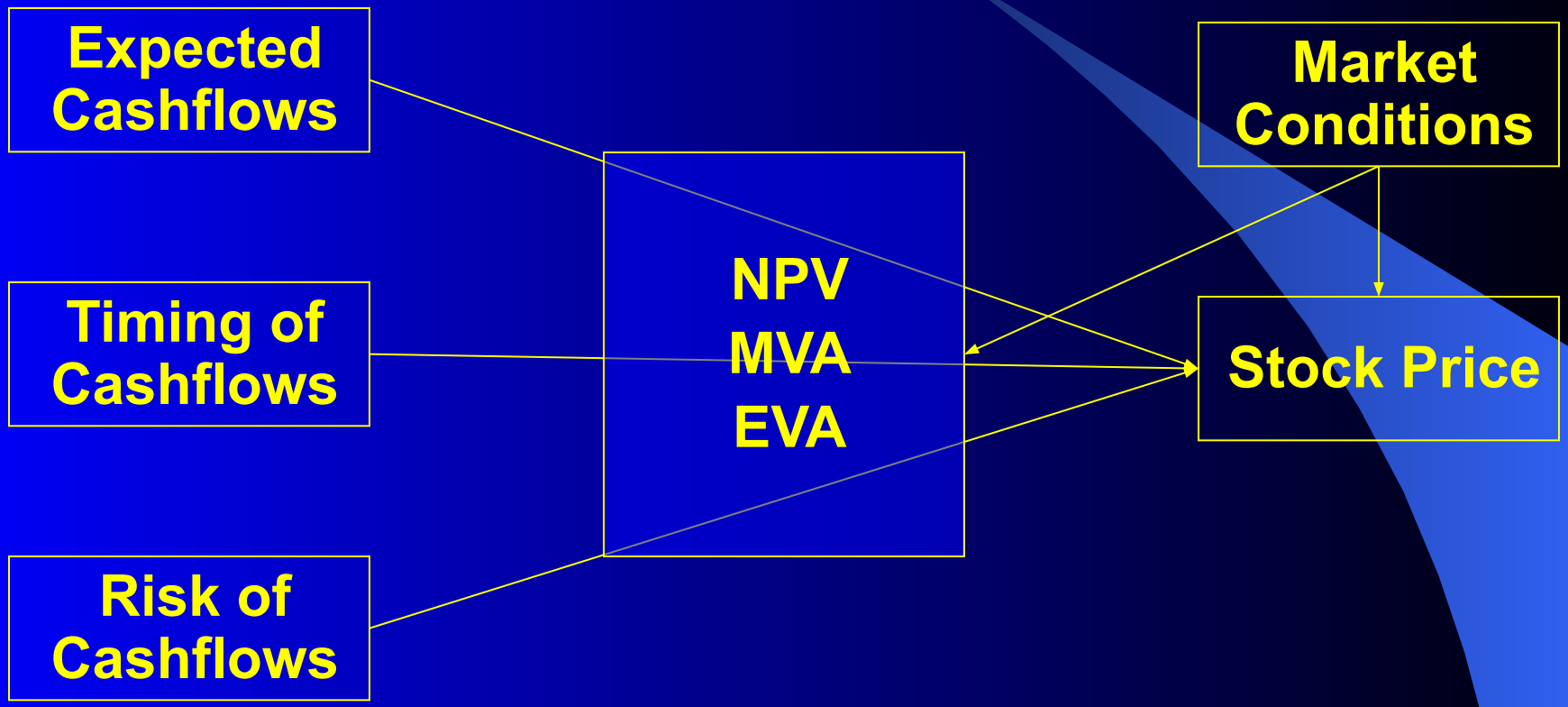
Financial Statement Analysis

Financial Statement Analysis: Lecture Outline

- **Review of Financial Statements**
- **Review of 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**

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 earnings**

Liquidity Ratio Examples: Dell

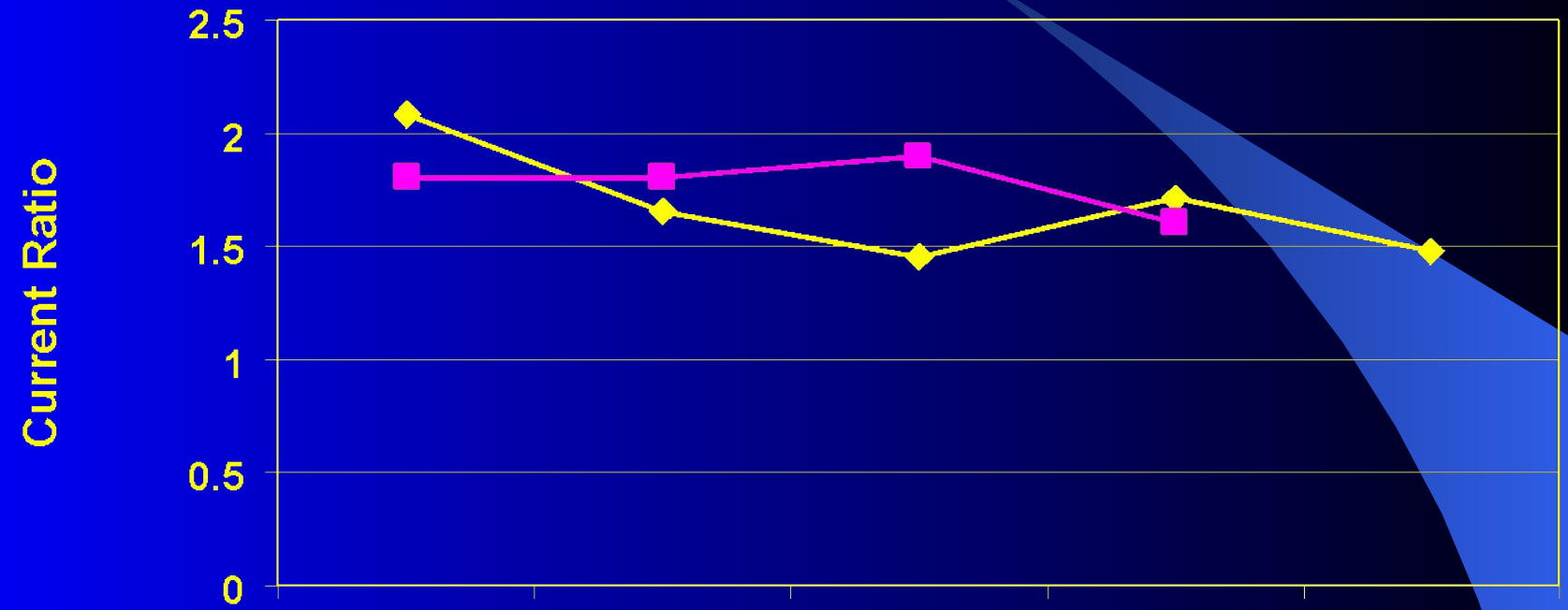
- **Current Ratio:**

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

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

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

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	

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

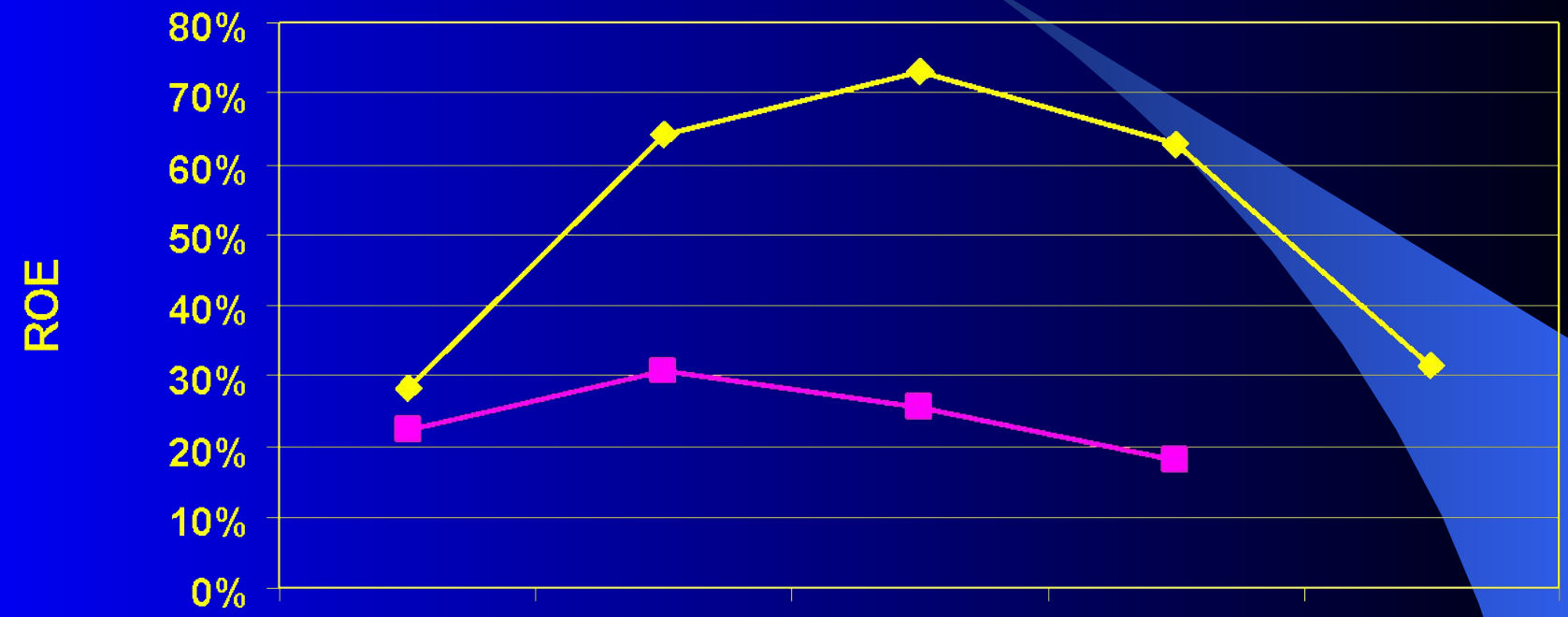
- **Net Profit Margin:**

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

- **Retention Ratio**

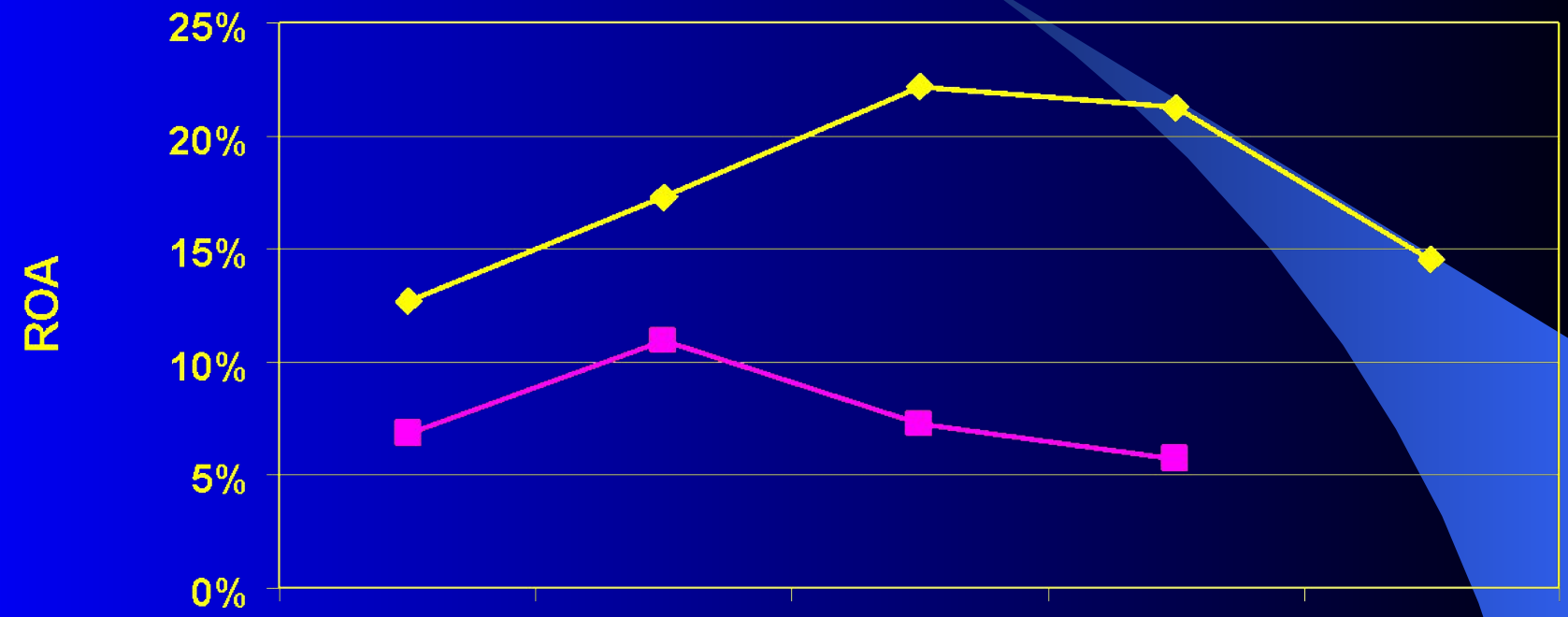
$$\text{Retention Ratio}\,(\rho) := \frac{\text{EPS - Div}}{\text{EPS}} = \frac{\$0.66 - \$0}{\$0.66} = 100\%$$

Ratio Comparison: ROE



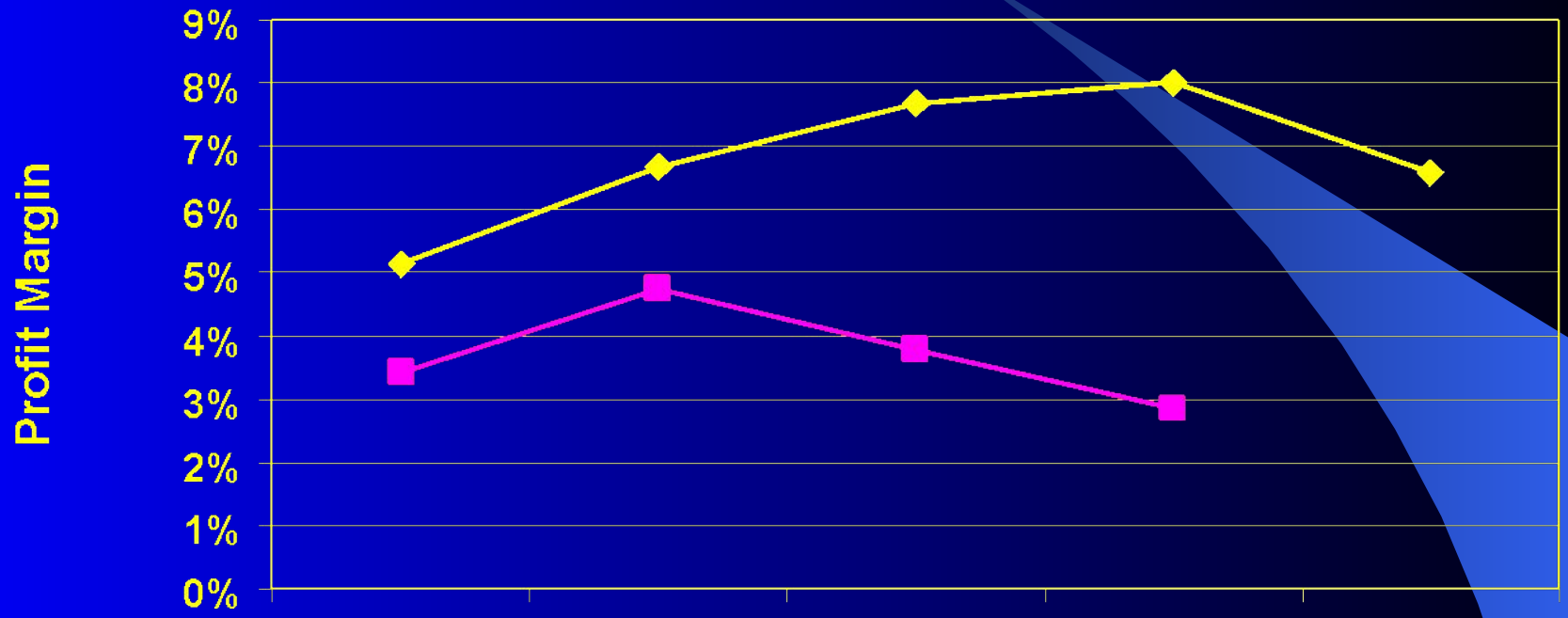
	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	28.13%	64.27%	73.01%	62.90%	31.39%
Industry	22.30%	30.60%	25.50%	18.00%	

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

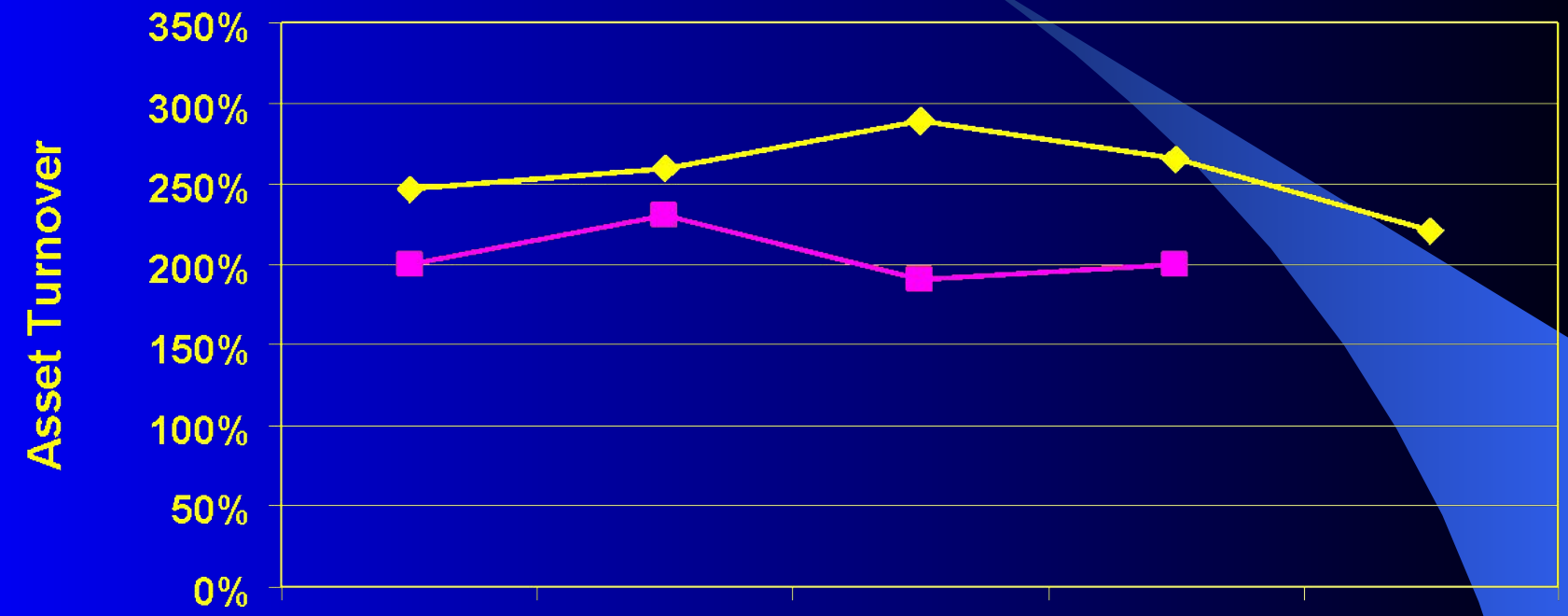
- **Total Asset Turnover Ratio:**

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

- **Inventory Turnover Ratio:**

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

Ratio Comparison: Asset Turnover

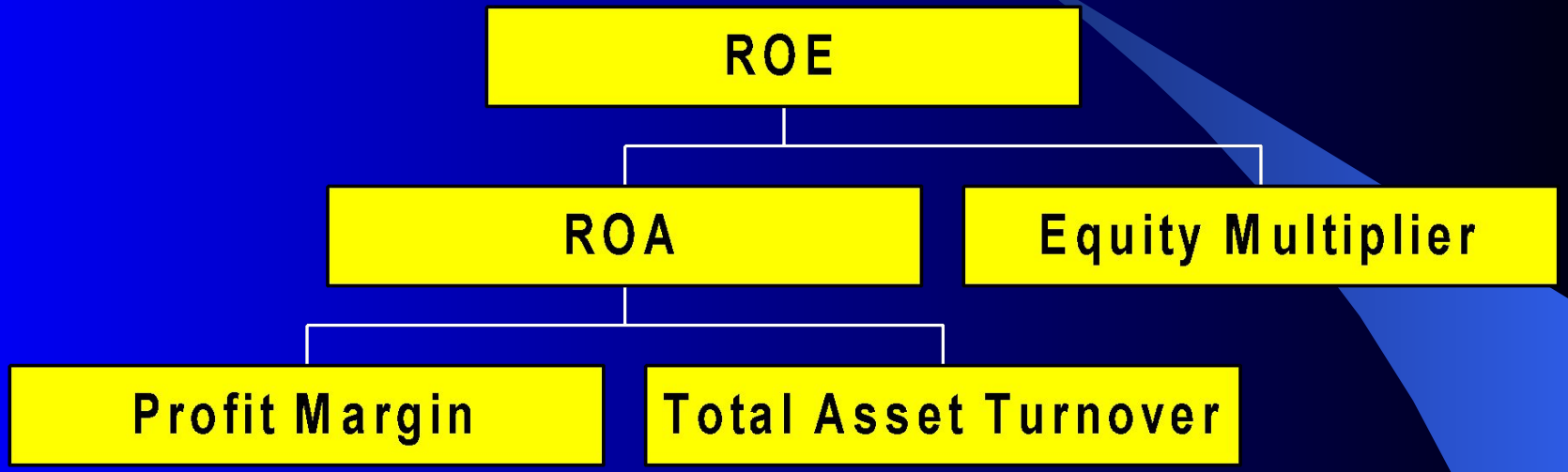


	Jan-96	Jan-97	Jan-98	Jan-99	Jan-00
Dell	2.47	2.59	2.89	2.65	2.20
Industry	2.00	2.30	1.90	2.00	

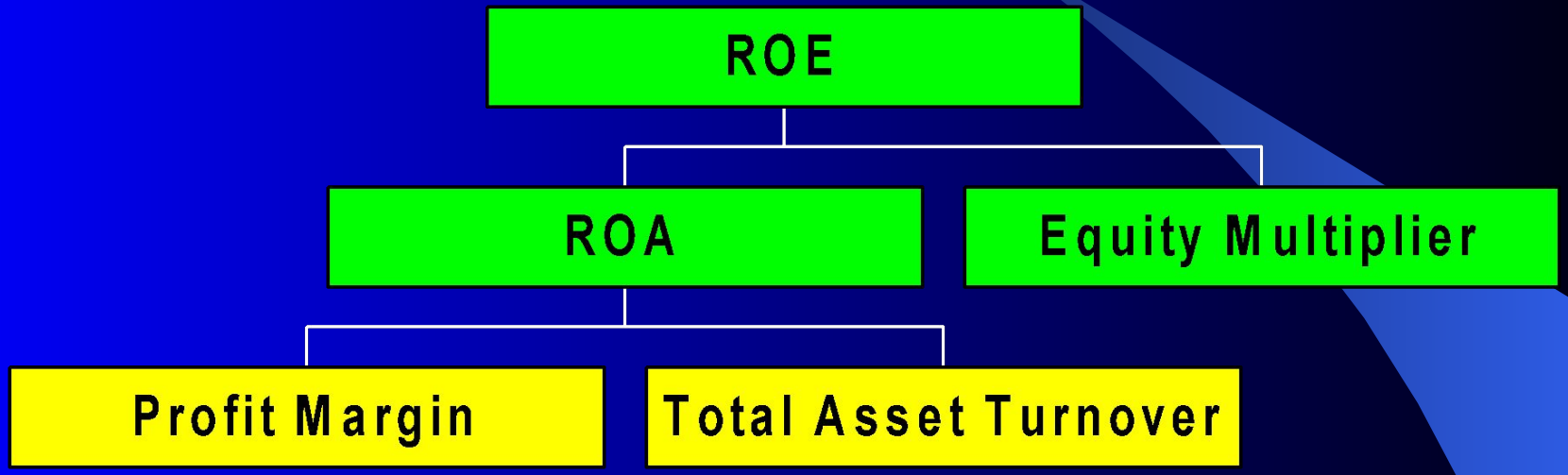
The DuPont System

- **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



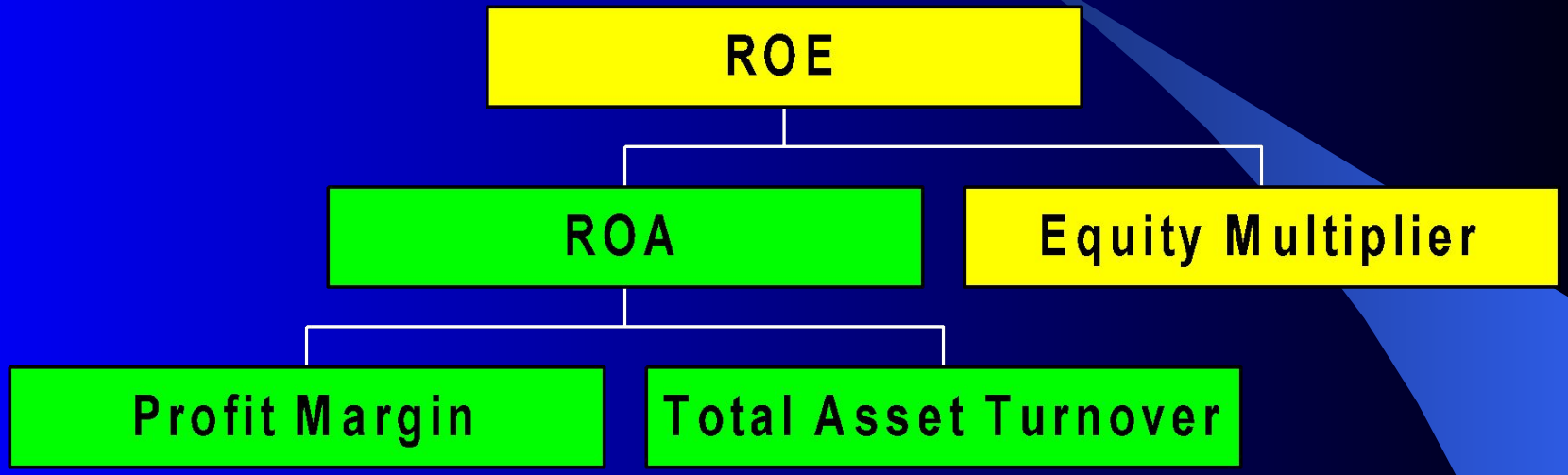
The DuPont System



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

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

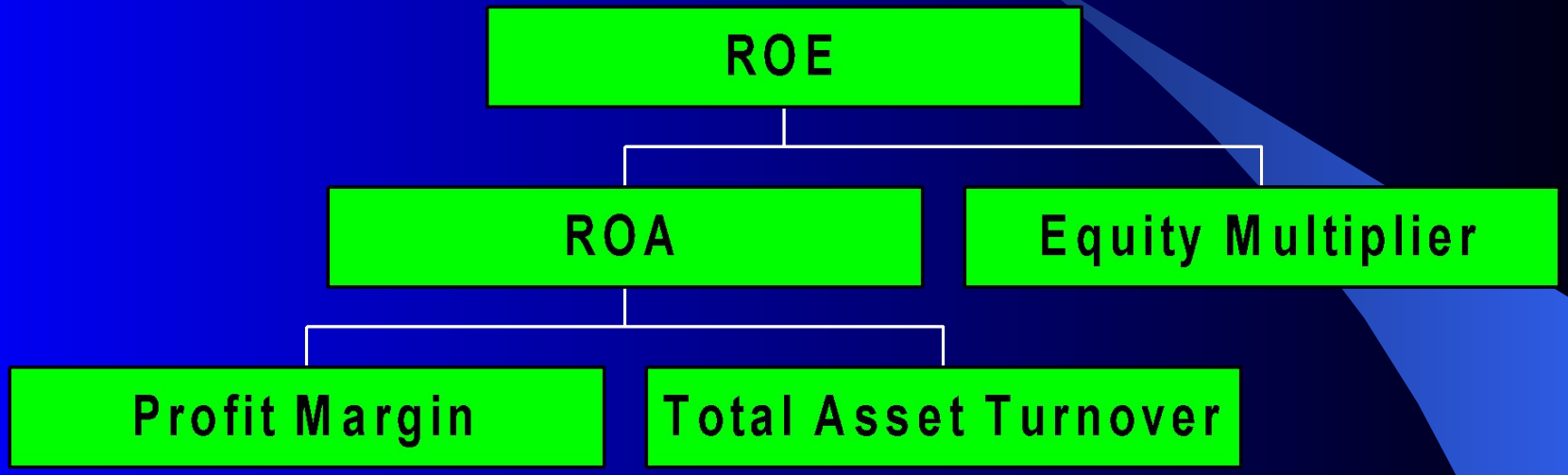
The DuPont System



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

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

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

Ratios and Forecasting

- **Common stock valuation based on**
  - **Expected cashflows to stockholders**
  - **ROE and ρ 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**

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**

Limitations of Ratio Analysis

- **We have been talking as if management always wants to increase ROE or as if a high ROE is always better.**
  - **If company A has a higher ROE than company B is company A necessarily better?**
  - **If a company increases its ROE is it necessarily evidence of improved performance?**
- **There are three critical problems with ROE.**
  - **Often called the timing problem, the value problem, and the risk problem.**

The Timing Problem

- **As a decision-maker in a business environment you are often encouraged to focus your attention on the past and particularly on one period in the past – correct?**
- **Sounds silly, but this is exactly what ROE does.**
- **Clearly last year's ROE must be taken in context.**
  - **If not it is virtually meaningless.**
  - **If company ROE was lower last year than it was two years ago the company *must* be doing worse – correct?**

The Risk Problem

- **We talked a lot about how risk and return go together. ROE is a "return" like measure so where is the risk dimension?**
- **This problem alone makes ROE an inaccurate and possibly misleading indicator of financial performance.**
- **One has to realize that the risk dimension is missing and so be particularly wary of making comparisons across companies using ROE alone.**

The Value Problem

- **ROE measures a "return" figure but it is based on two accounting figures.**
- **The numerator is net income and this is not free cash flow (the cash flow that the company could payout to its investors).**
- **Secondly, even if net income is close to free cash flow, ROE is measured relative to book value of equity not the market value of equity.**
- **It is the market value investors must pay to purchase a share of the firm's equity and this is generally higher than the book value.**

How Might Ratios Help

- **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**