



Managerial Finance

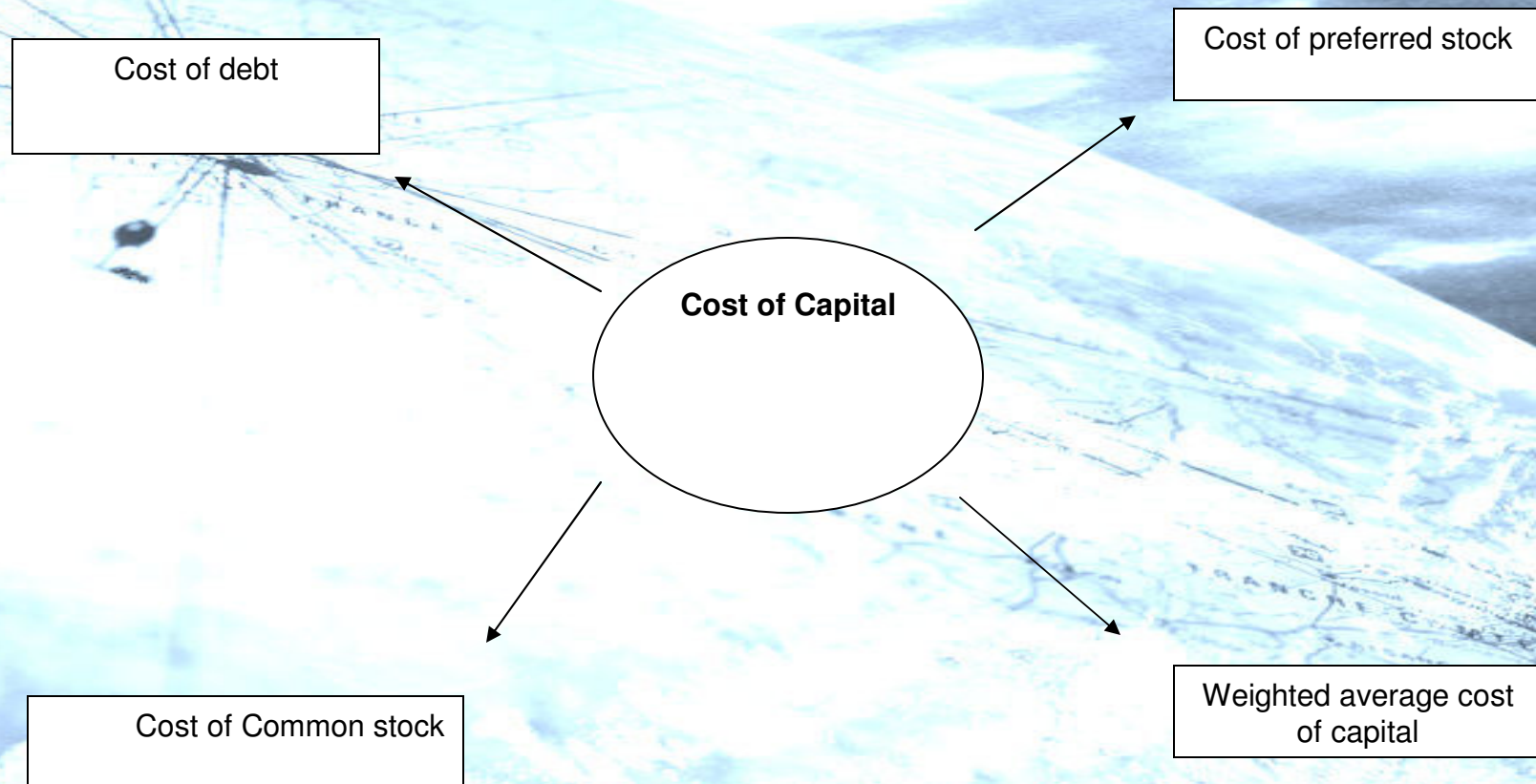
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The Cost of Capital

Chapter IX

Learning Objectives





The Cost of Capital

- Cost of Capital Components
 - Debt
 - Preferred
 - Common Equity
- WACC



What is cost of capital?

- Money has cost
- Investors expects returns in their investments
- Company consider the return required as cost of capital

What types of long-term capital do firms use?

- Long-term debt
- Preferred stock
- Common equity


Each should have
different minimum return



Capital components are sources of funding that come from investors

Accounts payable, accruals, and deferred taxes are not sources of funding that come from investors, so they are not included in the calculation of the cost of capital

We do adjust for these items when calculating the cash flows of a project, but not when calculating the cost of capital.



Should we focus on historical
(embedded) costs or new
(**marginal**) costs?

The cost of capital is used primarily to make decisions which involve raising and investing new capital. So, we should focus on marginal costs.

Learning Game Placeholder

Learning Game: Choices

Title: Component cost of capital

Component Cost of Debt

- Interest is tax deductible, so the after tax (AT) cost of debt is:

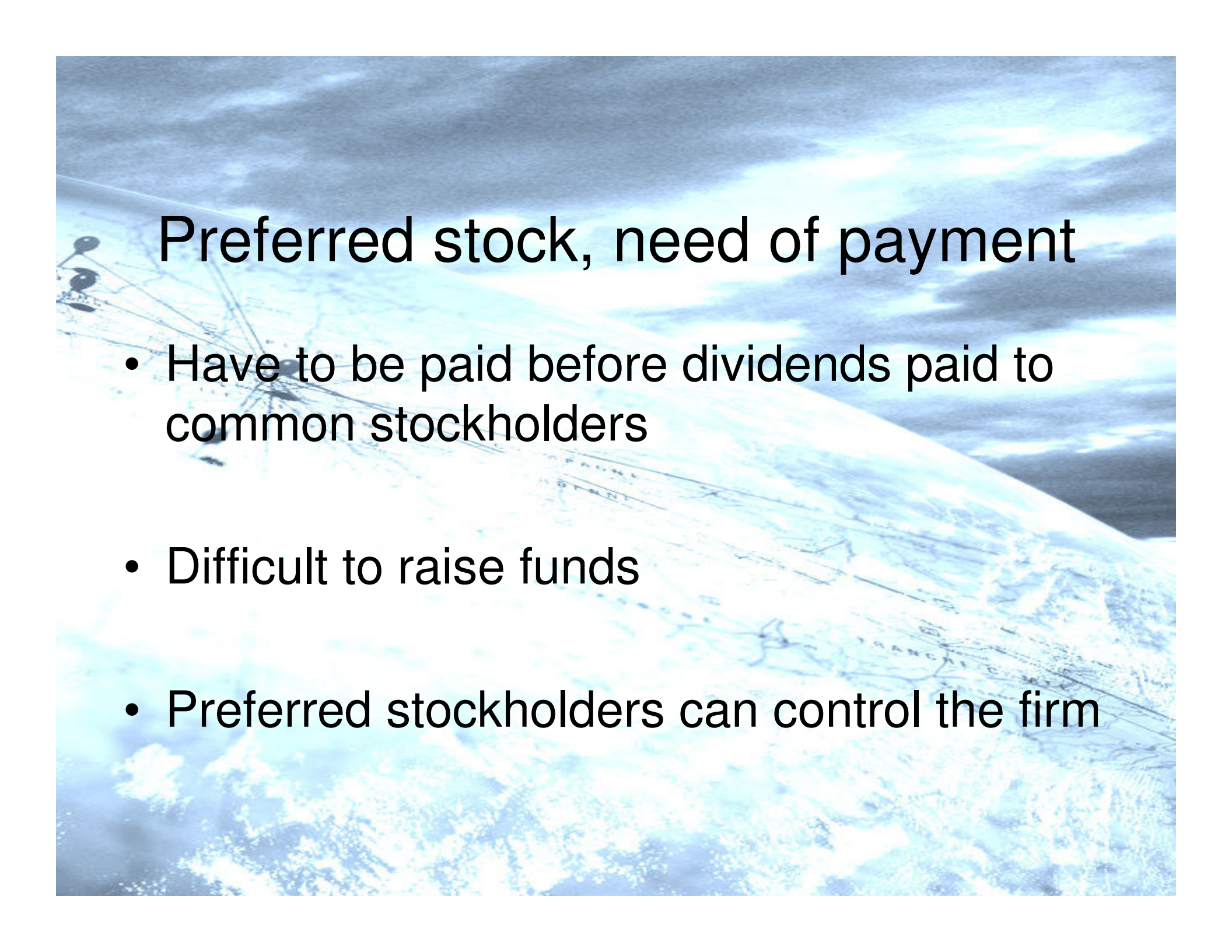
$$\begin{aligned}r_{d \text{ AT}} &= r_{d \text{ BT}}(1 - T) \\ &= 10\%(1 - 0.40) = 6\%.\end{aligned}$$

- Flotation costs small, so ignore.

Cost of preferred stock r_{ps}

- Not tax deductible
- Flotation cost is higher and need to be incorporated

$$r_{ps} = \frac{D_{ps}}{P_n}$$

An aerial photograph of a city, likely San Francisco, with a semi-transparent map overlay. The map shows streets and landmarks, with the word 'SAN FRANCISCO' visible in the lower right. The sky is blue with some clouds. The text is overlaid on the map area.

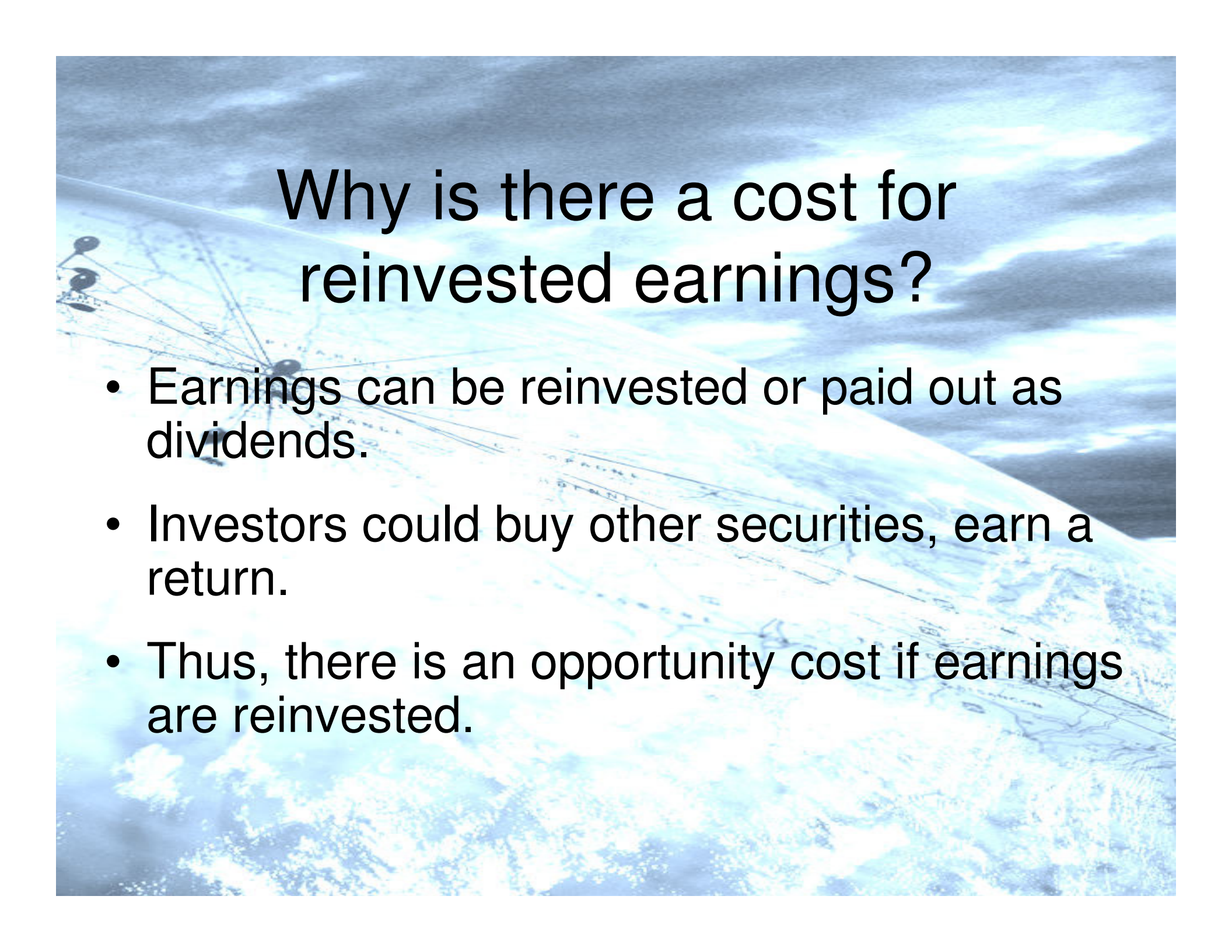
Preferred stock, need of payment

- Have to be paid before dividends paid to common stockholders
- Difficult to raise funds
- Preferred stockholders can control the firm

An aerial photograph of a city, likely San Francisco, with a semi-transparent map overlay. The map shows streets and landmarks, with the word 'SAN FRANCISCO' visible. The background is a blue sky with light clouds. The text is overlaid on the map area.

Two ways to raise common equity?

- Directly, by issuing new shares of common stock.
- Indirectly, by reinvesting earnings that are not paid out as dividends (i.e., retaining earnings).



Why is there a cost for reinvested earnings?

- Earnings can be reinvested or paid out as dividends.
- Investors could buy other securities, earn a return.
- Thus, there is an opportunity cost if earnings are reinvested.



Raising new shares

- Flotation cost is high
- Investors perceive “negative sign”
- Increase supply of stock reducing the price

Learning Game Placeholder

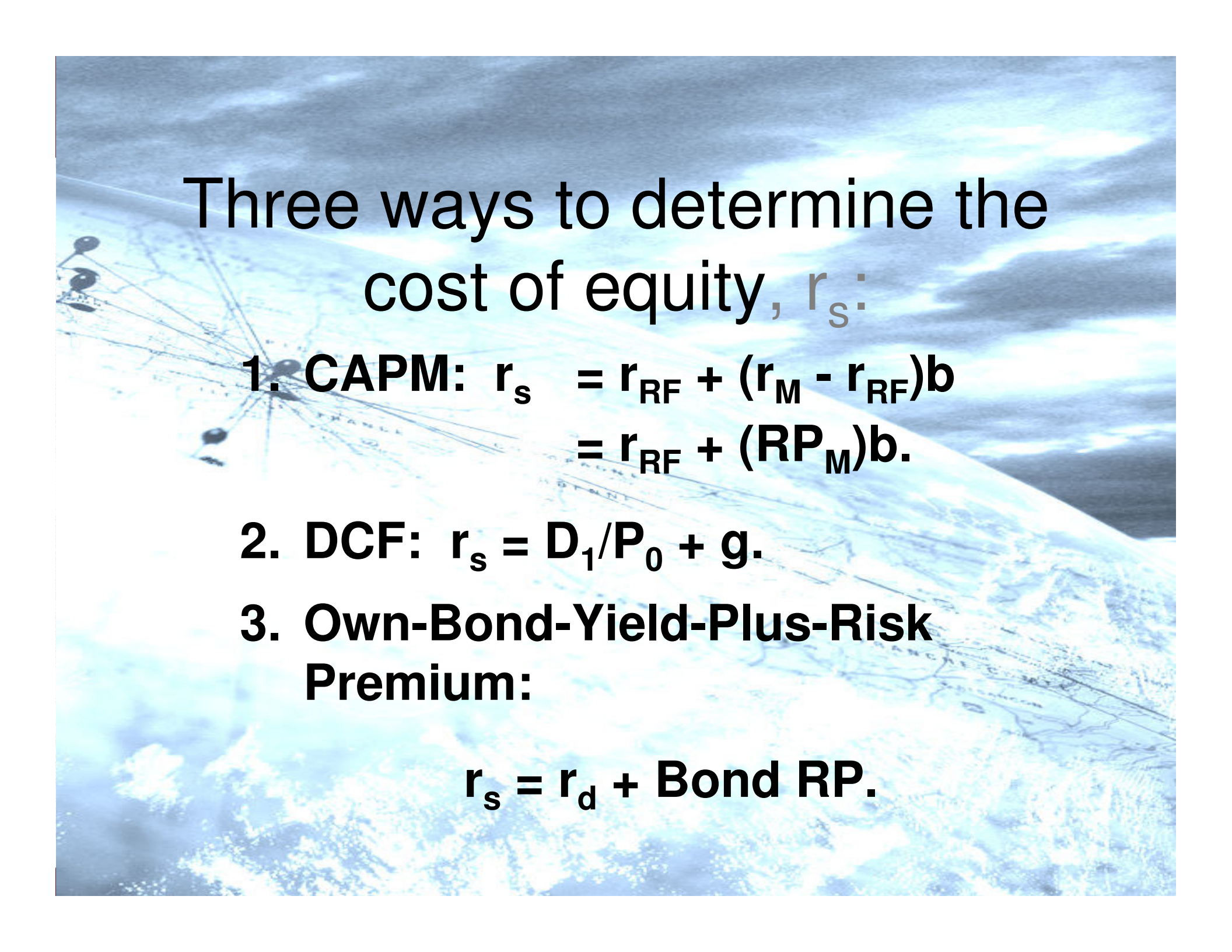
Learning Game: Choices

Title: Cost of debt

Learning Game Placeholder

Learning Game: Choices

Title: Cost of common stock



Three ways to determine the cost of equity, r_s :

1. **CAPM:** $r_s = r_{RF} + (r_M - r_{RF})b$
 $= r_{RF} + (RP_M)b.$

2. **DCF:** $r_s = D_1/P_0 + g.$

3. **Own-Bond-Yield-Plus-Risk Premium:**

$$r_s = r_d + \text{Bond RP.}$$

An aerial photograph of a cable-stayed bridge, likely the Golden Gate Bridge, with a semi-transparent map overlay. The map shows the bridge's location and surrounding areas. The text is overlaid on the image.

What's the cost of equity
based on the CAPM?

$$r_{RF} = 7\%, RP_M = 6\%, b = 1.2.$$

$$r_s = r_{RF} + (r_M - r_{RF})b.$$

$$= 7.0\% + (6.0\%)1.2 = 14.2\%.$$

What's the DCF cost of equity, r_s ?

Given: $D_0 = \$4.19$; $P_0 = \$50$; $g = 5\%$.

$$\begin{aligned} r_s &= \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g \\ &= \frac{\$4.19(1.05)}{\$50} + 0.05 \\ &= 0.088 + 0.05 \\ &= \mathbf{13.8\%}. \end{aligned}$$

Find r_s using the own-bond-yield-plus-risk-premium method.

($r_d = 10\%$, $RP = 4\%$.)

$$r_s = r_d + RP$$

$$= 10.0\% + 4.0\% = 14.0\%$$

What's a reasonable final estimate of r_s ?

<u>Method</u>	<u>Estimate</u>
CAPM	14.2%
DCF	13.8%
$r_d + RP$	<u>14.0%</u>
Average	<u>14.0%</u>

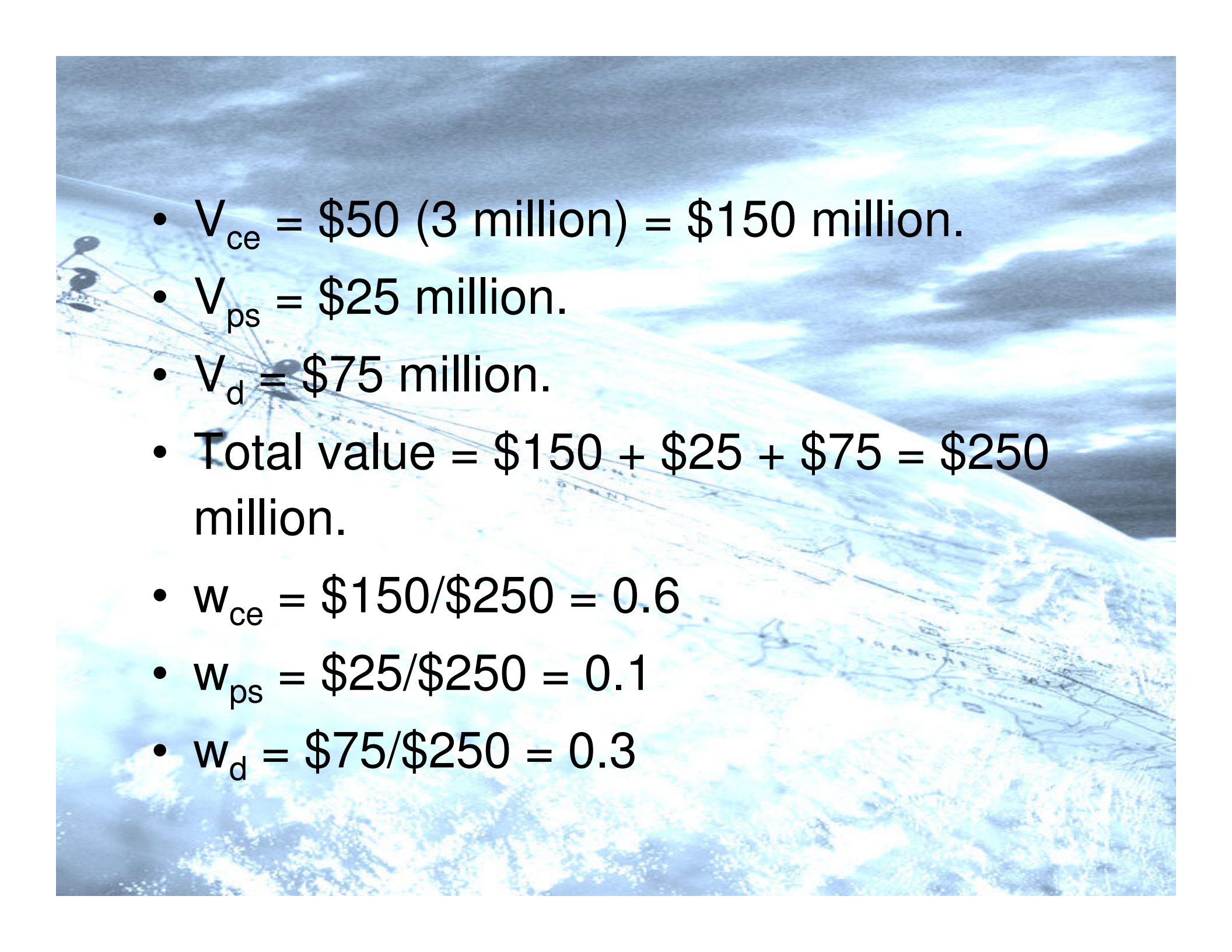
Determining the Weights for the WACC

- The weights are the percentages of the firm that will be financed by each component.
- If possible, always use the target weights for the percentages of the firm that will be financed with the various types of capital.

Estimating Weights (Continued)

- Suppose the stock price is \$50, there are 3 million shares of stock, the firm has \$25 million of preferred stock, and \$75 million of debt.

(More...)

- 
- $V_{ce} = \$50 (3 \text{ million}) = \150 million.
 - $V_{ps} = \$25 \text{ million.}$
 - $V_d = \$75 \text{ million.}$
 - $\text{Total value} = \$150 + \$25 + \$75 = \250 million.
 - $w_{ce} = \$150/\$250 = 0.6$
 - $w_{ps} = \$25/\$250 = 0.1$
 - $w_d = \$75/\$250 = 0.3$

What's the WACC?

$$\text{WACC} = w_d r_d (1 - T) + w_{ps} r_{ps} + w_{ce} r_s$$

$$= 0.3(10\%)(0.6) + 0.1(9\%) + 0.6(14\%)$$

$$= 1.8\% + 0.9\% + 8.4\% = 11.1\%.$$

WACC Estimates for Some Large U. S. Corporations

Company	WACC	w_d
Intel (INTC)	16.0	2.0%
Dell Computer (DELL)	12.5	9.1%
BellSouth (BLS)	10.3	39.8%
Wal-Mart (WMT)	8.8	33.3%
Walt Disney (DIS)	8.7	35.5%
Coca-Cola (KO)	6.9	33.8%
H.J. Heinz (HNZ)	6.5	74.9%
Georgia-Pacific (GP)	5.9	69.9%

An aerial photograph of a power transmission tower with several power lines extending from it. The image is overlaid with a semi-transparent map of a region, likely in California, showing cities like San Francisco and Oakland. The background is a cloudy sky.

Factors affecting WACC

- Factors that firms can control
- Factors that firms cannot control



Factors the firm can control

- Capital risk structure
- Dividend policy
- Investment policy



Factors the firm cannot control

- Levels of interest rates
- Market risk premium
- Tax rates



Should the company use the composite WACC as the hurdle rate for each of its divisions?

- NO! The composite WACC reflects the risk of an average project undertaken by the firm.
- Different divisions may have different risks. The division's WACC should be adjusted to reflect the division's risk and capital structure.

Learning Game Placeholder

Learning Game: Choices

Title: Factors affecting WACC

An aerial photograph of a city, likely San Francisco, with a white rectangular text box overlaid in the upper center. The city's streets and buildings are visible in shades of blue and white. The text box contains the question 'What are the three types of project risk?' in a dark grey, sans-serif font.

What are the three types of project risk?

- Stand-alone risk
- Corporate risk
- Market risk