



Universidad del Desarrollo
Universidad de Excelencia

Finance I

Fall 2012

Session 11:

Cost of Capital



1. Recap

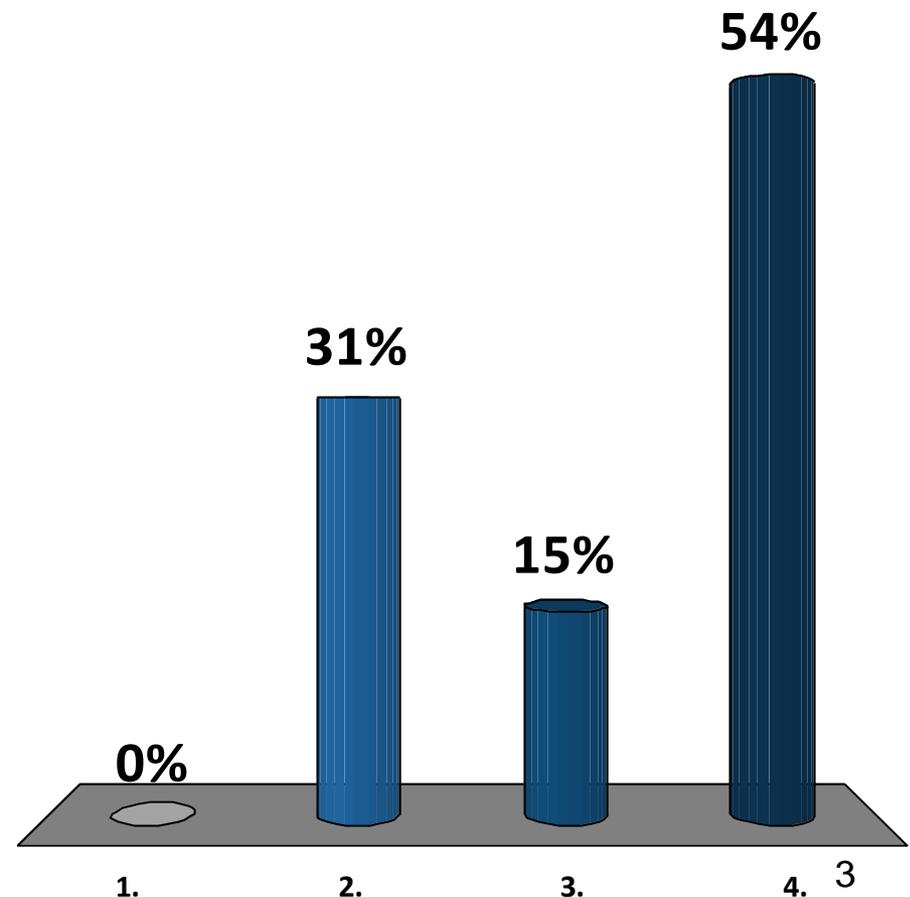
2. Cost of Capital

3. APT and 3 Factor Model

4. Closing

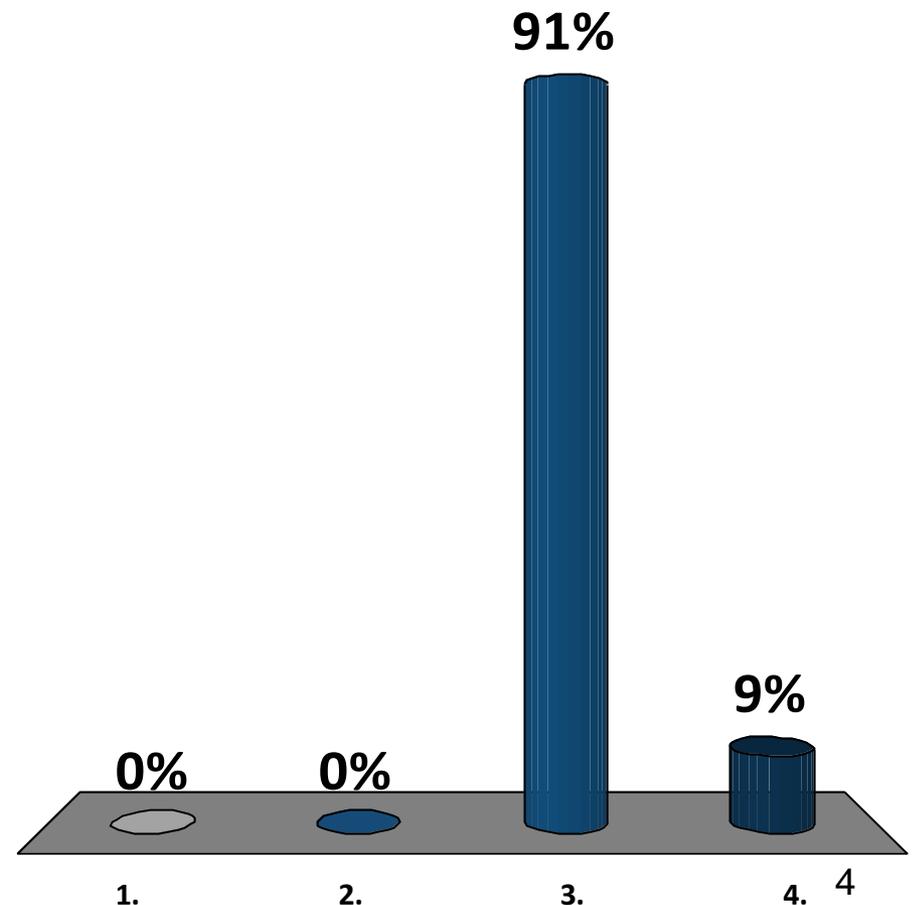
1. Which of the following is not a flaw of CAPM?

1. The assumptions are not consistent with reality
2. Betas are not stable thru time
3. CAPM explains a little fraction of the required return
- ✓ 4. It's difficult to calculate



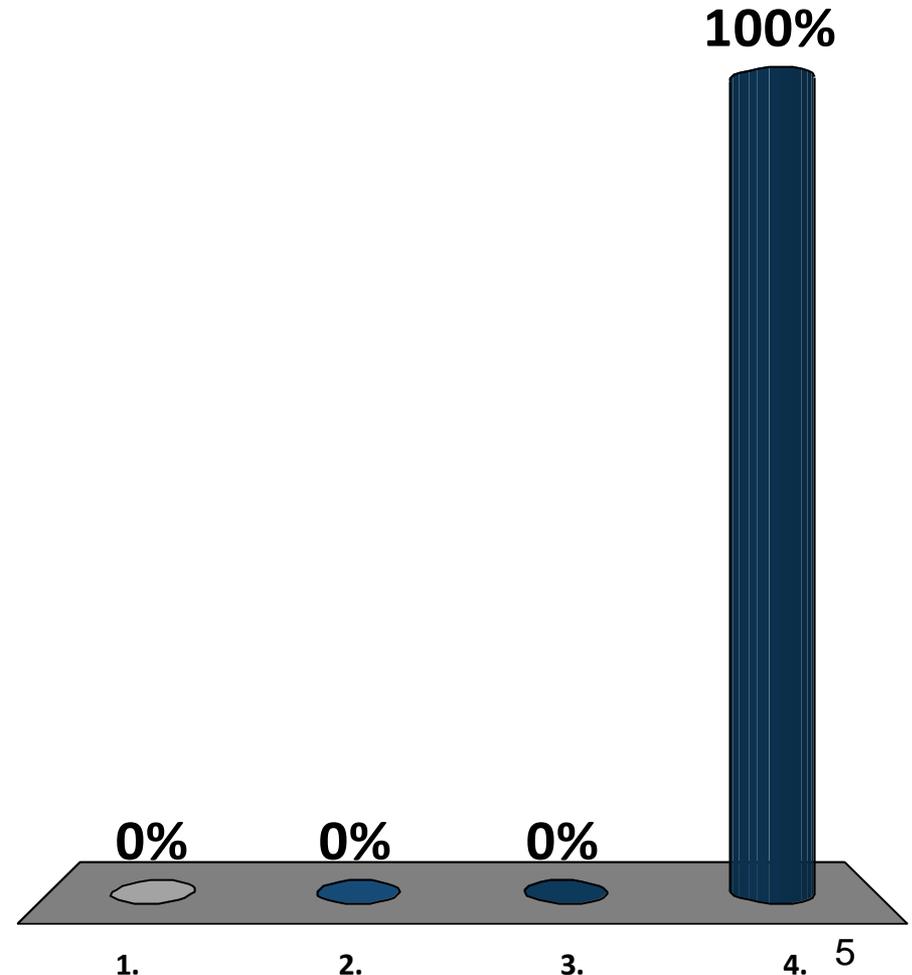
2. Which of the following is a flaw of APT?

1. The risk factors included are the same for each asset
2. It requires a minimum of 3 risk factors
- ✓ 3. It's difficult to calculate
4. The risk factors included are required to be different for each company



3. The use of the 3 factor model is limited because...

1. It requires a minimum of 3 risk factors
2. It's difficult to calculate
3. It's too simple to calculate
- ✓ 4. CAPM use is more widespread

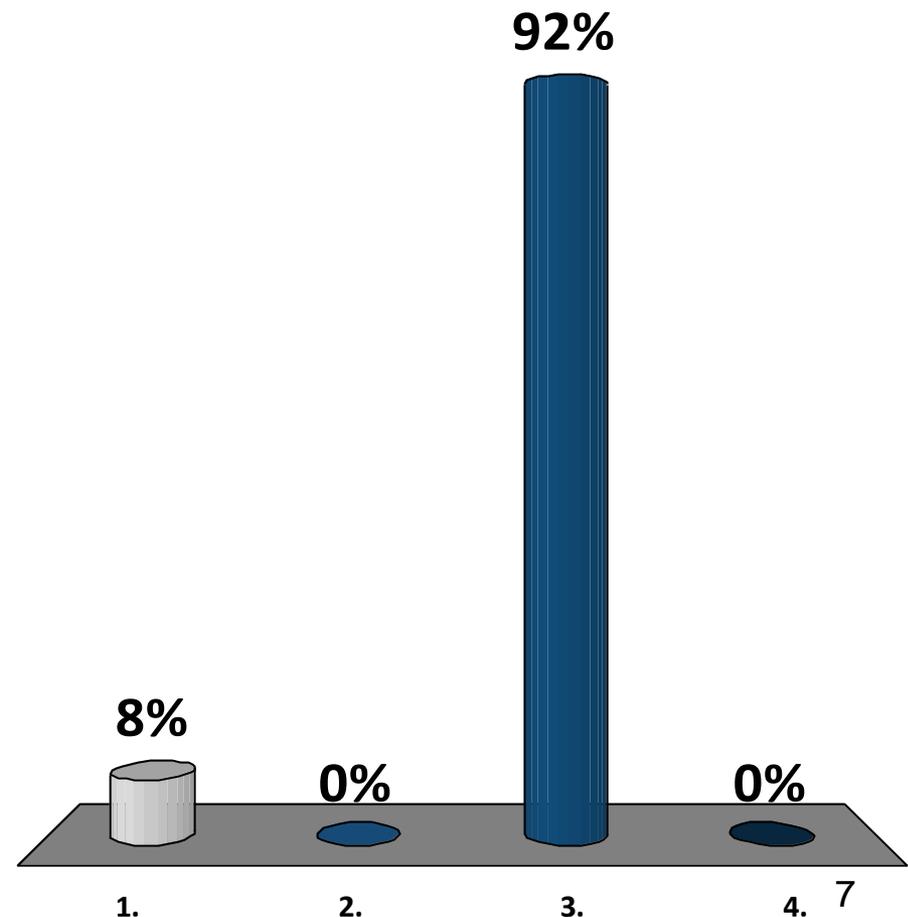


▶ **The expected return on a portfolio of all the company's existing securities**

- Assuming the company is rational, the expected return should be equal (or higher) than the required return given the risk of its securities
- If a new project has the same level of risk as the company, the required return should be the same

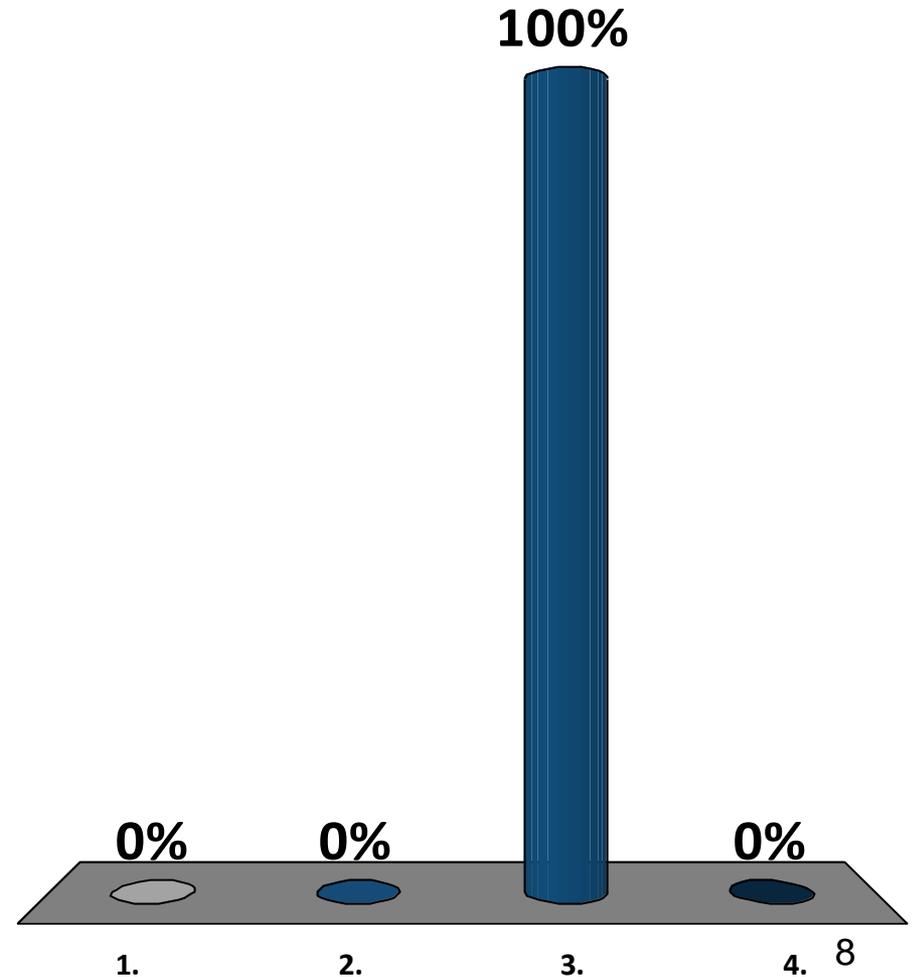
4. How do we calculate the expected return of a portfolio?

1. $x_1^2\sigma_1^2 + x_2^2\sigma_2^2 + 2x_1x_2\sigma_1\sigma_2\rho$
2. It depends on the risk profile of the assets within the portfolio
3. It's the weighted average expected return of its assets
- ✓ 4. It depends on the maturity of the returns



5. What would be the required expected return of a new project (C), that has the same risk of a portfolio with 2 projects, (60% weight, $E(r_1) = 10\%$ and 40% weight, $E(r_2) = 25\%$)?

- 1. 17.5%
- 2. 20%
- ✓ 3. 16%
- 4. 100%

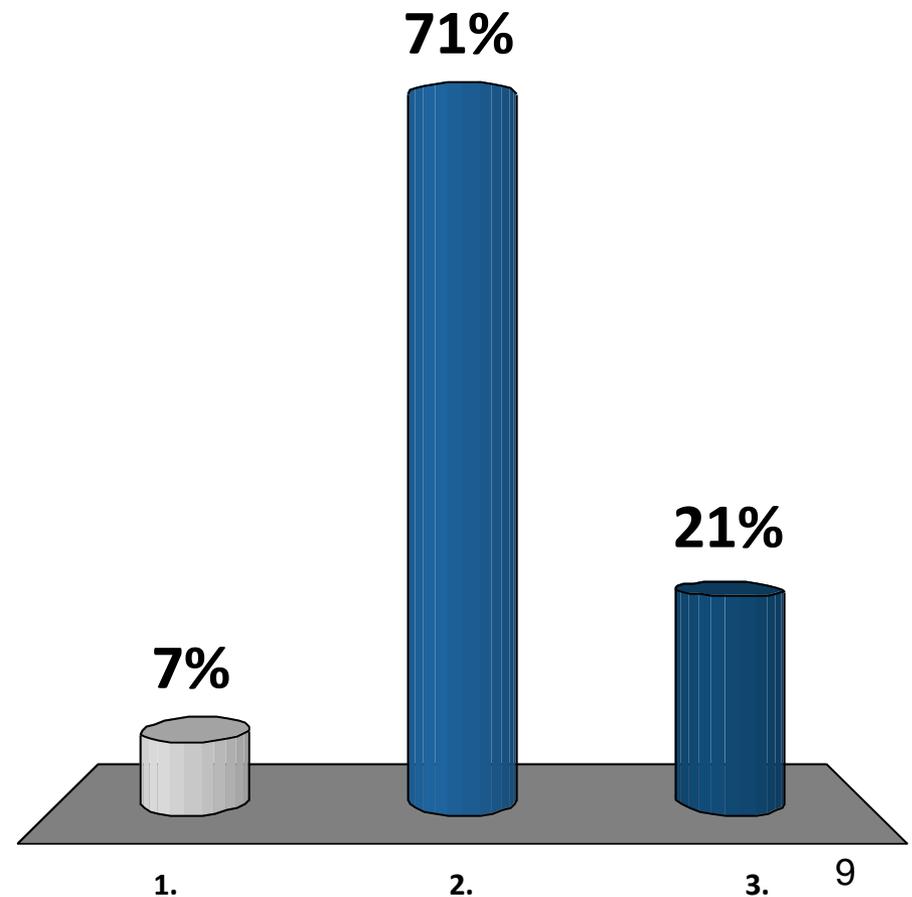


6. Assume that project C has the same risk as the company, and it offers an expected return of 17%. Should you perform the project?

1. No

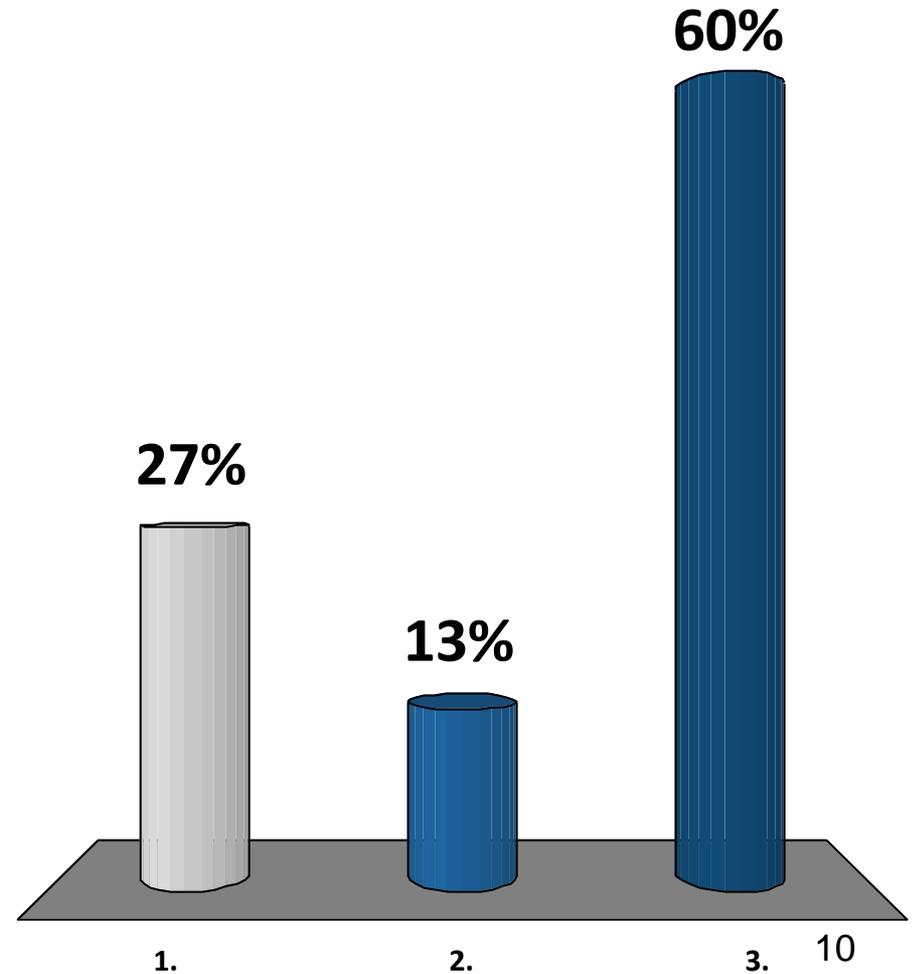
2. Yes

✓ 3. Depends



7. Assume that project C has the same risk as the company, and it offers an expected return of 15%. Should you perform the project?

- ✓ 1. No
- 2. Yes
- 3. Depends



- ▶ **Other way to think about cost of capital:**

- ▶ **Different sources of funds imply different levels of risk**
 - Equity (shareholders)
 - Debt (Lenders and banks)
 - As mentioned, given the limited liability and the residual claim (owners get paid after debt is paid) shareholders hold higher risk than lenders

- ▶ **The asset's income is NOT affected by the source of funds**

- ▶ **The asset's revenue is GENERALLY affected by the source of funds (interest, corporate governance, tax)**

- ▶ **Lets start with the simplest case. Assume the revenue is NOT impacted by the sources of funds.**

- ▶ **If the project has an expected return of 16%, and the sources of funds are 50% bank debt and 50% shareholders.**

- ▶ **What should be the required return of banks and shareholders?**

- ▶ **Do we KNOW how much the bank expects to receive from the company?**
 - YES, it's the interest rate (at the most)!!!

- ▶ **Do we know how much the shareholders expect to receive?**
 - YES, the expect to receive whatever is left after the bank gets paid!!!

- ▶ **So... if the project has an expected return of 16% and the banks (that hold 50% of the company) require 12% interest rate, what would be the expected return of shareholders?**

- ▶ **First, lets determine what equation we should solve:**

- ▶ **Now, lets solve the equation**

- ▶ **So... if the project has an expected return of 16%, bank 1 (that holds 50% of the company) requires 12% interest rate, bank 2 (that holds 20% of the company) requires 15%, what would be the expected return of shareholders?**

- ▶ **First, lets determine what equation we should solve:**

- ▶ **Now, lets solve the equation**

- ▶ **As you can see from the previous equation, the cost of capital of a company is the Weighted Average of the Cost of Capital... cleverly called WACC**

- ▶ **The correct way to determine the cost of capital is to start from the company cost of capital AND THEN decompose it as a WACC.**

- ▶ **This is because:**
 - the return of the project is NOT affected (our assumption) by the sources of funds
 - the risk of the owners depend on the level of debt and interest charged.

- ▶ **Some students and professionals get confused by the name WACC and assume it's a bottom up average (from the required return of each component, you get the required return of the asset)**
 - THIS IS WRONG!!!!
 - The return for the shareholder is ALWAYS the result of decomposing the asset's return on each source of funds

▶ **A more complicated case => The source of funds DOES impact revenue.**

- Tax effects of debt. The interest paid to banks is considered an expense, therefore are deducted from the company's revenue.
- Dividends are not considered an expense

► Example:

- Project 1 has a perpetual profit of \$200 before tax. Tax rate is 25% = \$150 perpetual net profit
- The required investment is \$1000. => return of 15% perpetual
- If the company is owned by shareholders only, their return is $\$150/\$1000 \Rightarrow 15\%$ return

► If the company is financed 50% bank debt (\$500) at 10% and 50% shareholder (\$500)

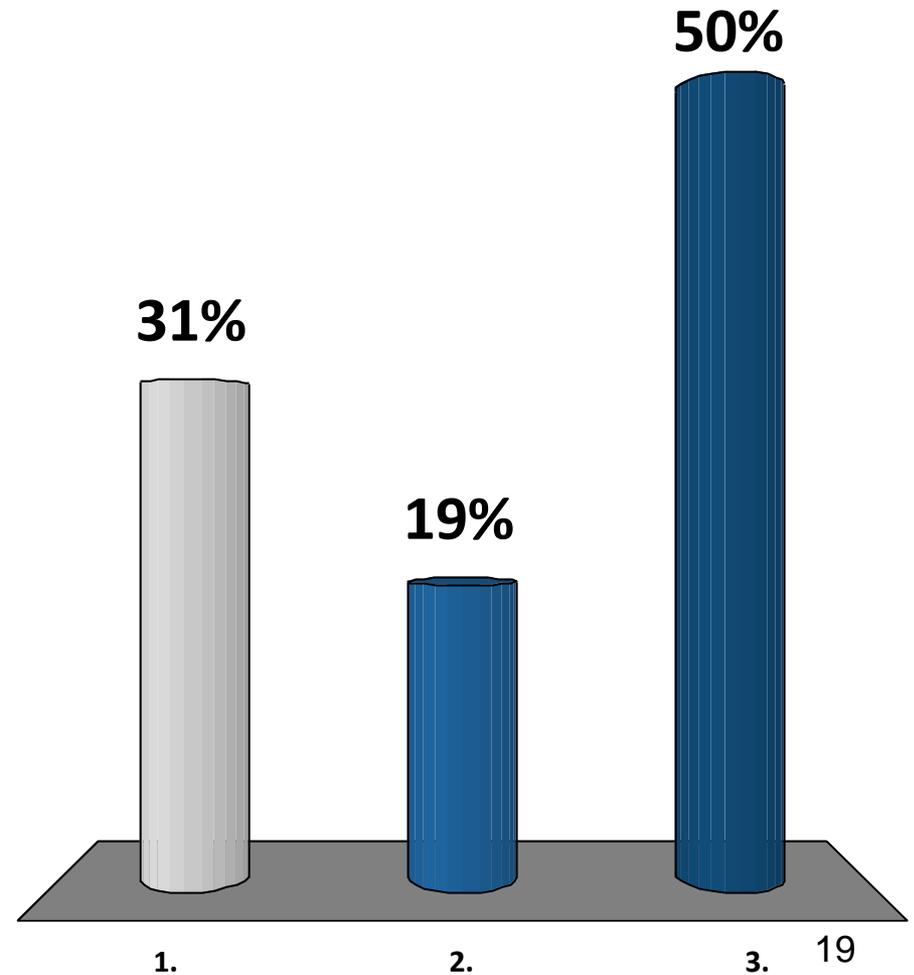
- Project has to pay interest of \$50 each year, so the profit before tax is \$150, and the net profit is \$112.5
- The return for the bank is $\$50/\$500 = 10\%$,
- The return for the shareholders is $\$112.5/\$500 = 22.5\%!!!!$
- Is this magic????
- Is this real???
- Is this consistent with financial theory???

▶ **Next class: chapter 10 and 18**

▶ **Quiz next Wednesday 25th**

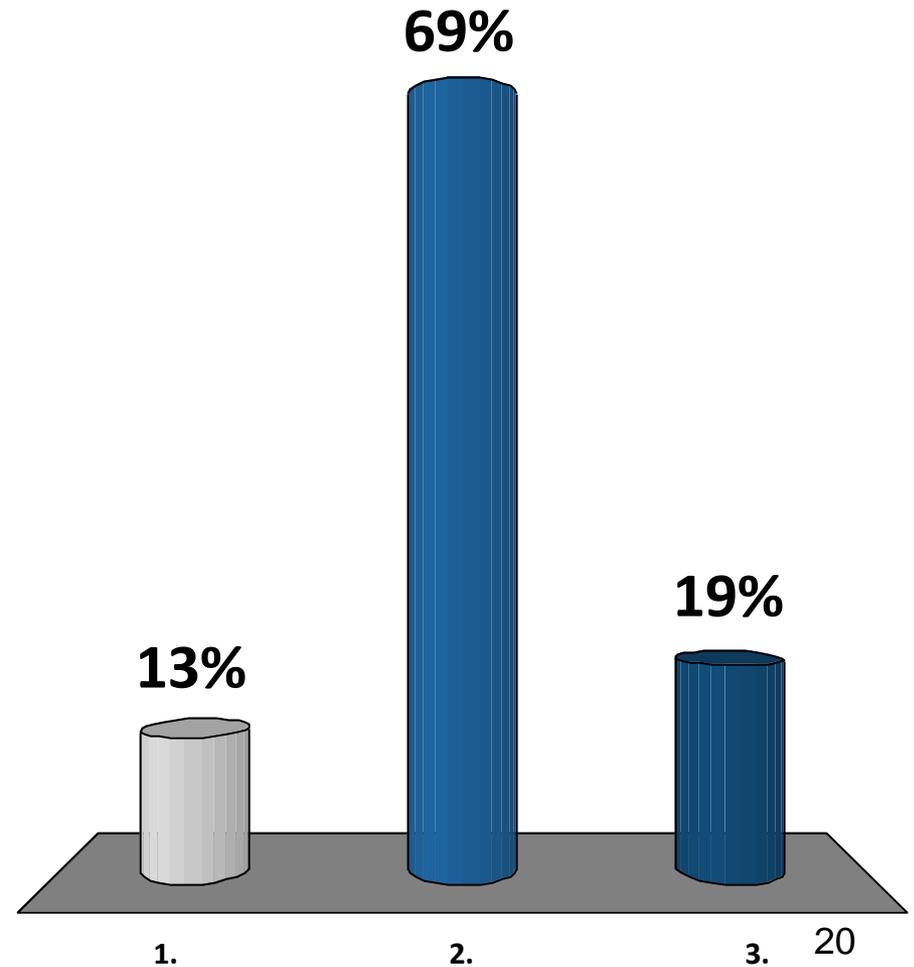
8. The company should always use the same cost of capital for every project?

- ✓ 1. No
- 2. Yes
- 3. Depends



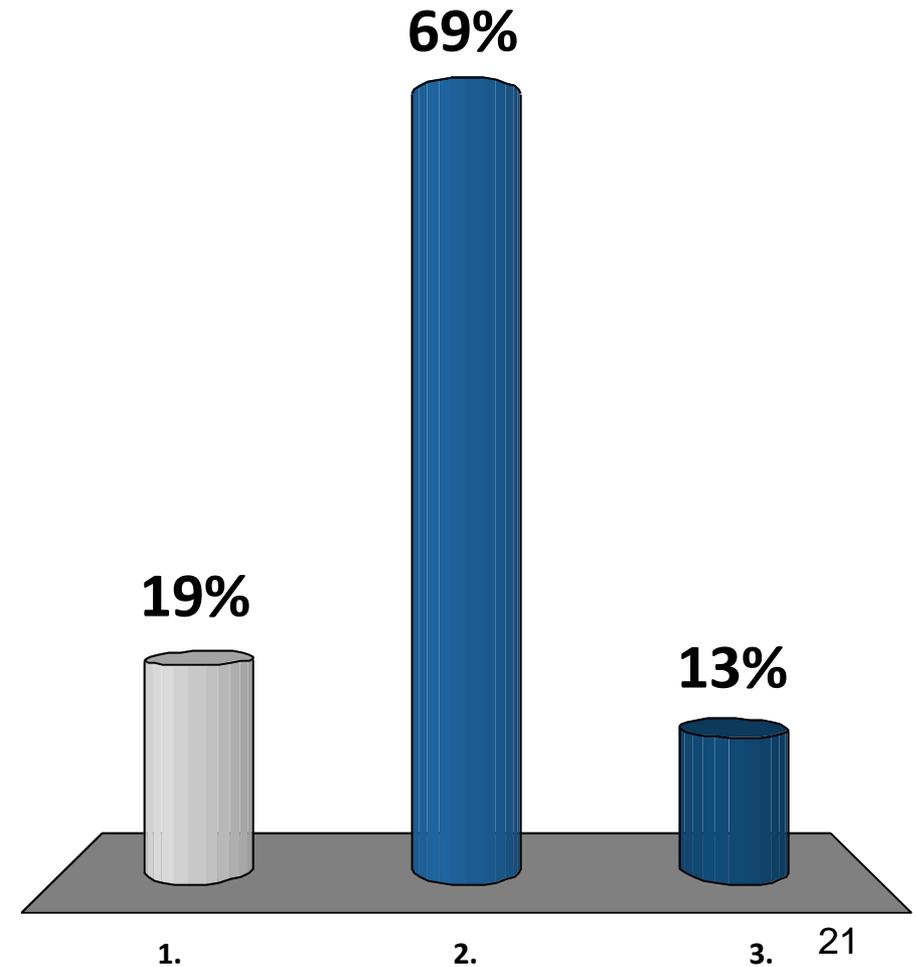
9. The company should always carry out projects with a return higher than the company's cost of capital?

- ✓ 1. No
- 2. Yes
- 3. Depends



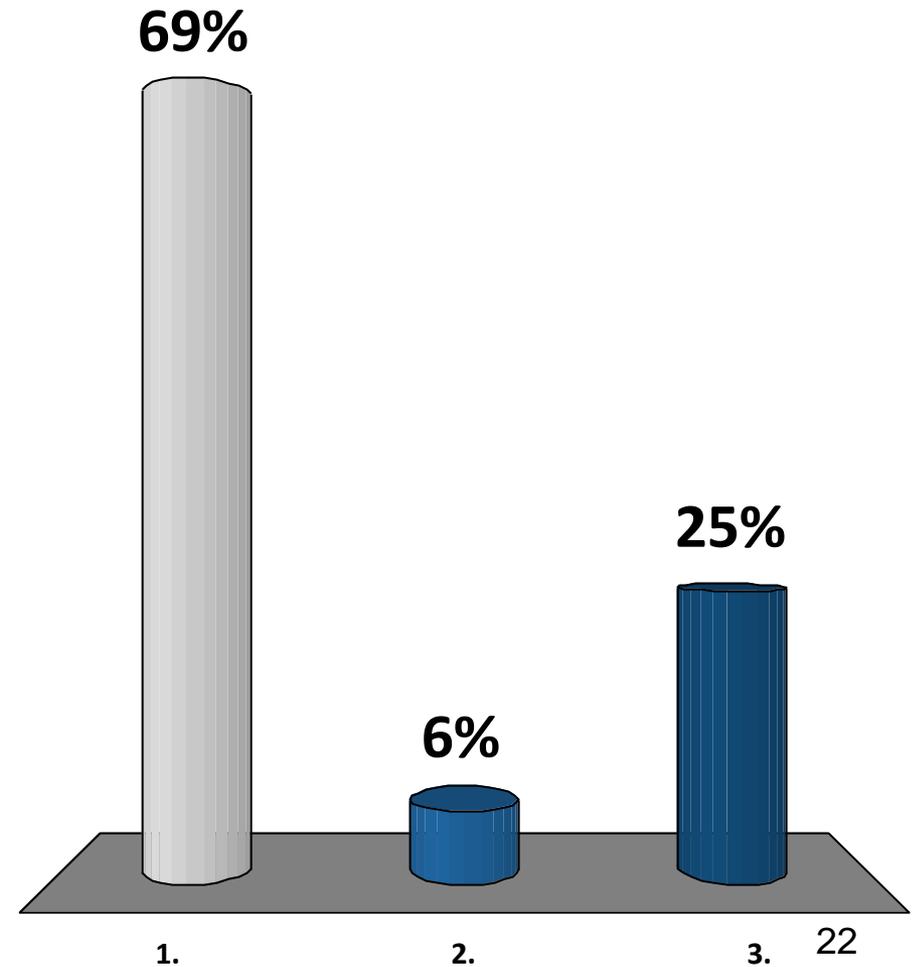
10. The company should always reject projects with a return lower than the company's cost of capital?

- ✓ 1. No
- 2. Yes
- 3. Depends



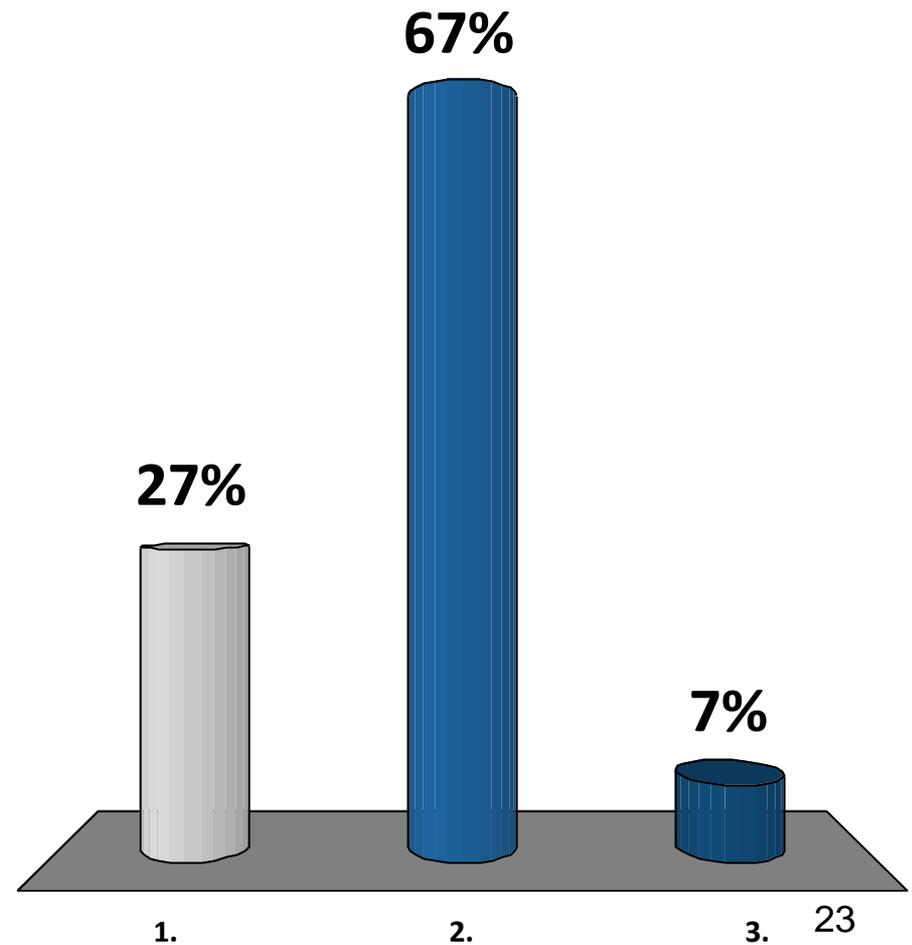
11. Increasing the level of debt always increases the rate of return of equity?

- ✓ 1. No
- 2. Yes
- 3. Depends



12. It's possible to increase the return of a project by increasing the level of debt

- ✓ 1. No
- 2. Yes
- 3. Depends



Puntuaciones de participantes

86	Lander DE SASIA	54	Gavin LACEY
80	Martin DIAZ	54	Javier SILBERSTEIN
78	Chong-Ren JIAN	50	Roberto ALLENDE
76	Martina VIDELA	42	Daniela TOLEDO
70	Anna ABRELL	36	Siva VAN DER MEER
68	Carlos HADDAD	32	Antonio CORREA
62	Miguel Angel CAMBARA		
62	Alejandra ILI NUÑO		
62	Nicolás VASQUEZ		
56	Josefa ROBLES		