

Sample Level II Item Set Questions

The following questions relate to Carlos Velasquez.

Carlos Velasquez, CFA, is a financial analyst with Embelesado, S.A., a Spanish manufacturer of sailboats and sailing equipment. Velasquez is evaluating a proposal for Embelesado to build sailboats for a foreign competitor that lacks production capacity and sells in a different market. The sailboat project is perceived to have the same risk as Embelesado's other projects.

The proposal covers a limited time horizon—three years—after which the competitor expects to be situated in a new, larger production facility. The limited time horizon appeals to Embelesado, which currently has excess capacity but expects to begin its own product expansion in slightly more than three years.

Velasquez has collected much of the information necessary to evaluate this proposal in Exhibits 1 and 2.

Exhibit 1 Selected Data for Sailboat Proposal (currency amounts in €millions)

Initial fixed capital outlay	60
Annual contracted revenues	60
Annual operating costs	25
Initial working capital outlay (recovered at end of the project)	10
Annual depreciation expense (both book and tax accounting)	20
Economic life of facility (years)	3
Salvage (book) value of facility at end of project	0
Expected market value of facility at end of project	5

Exhibit 2 Selected Data for Embelesado, S.A.

Book value of long-term debt/total assets	28.6%
Book value of equity/total assets	71.4%
Market value of long-term debt/market value of company	23.1%
Market value of equity/market value of company	76.9%
Coupon rate on existing long-term debt	8.5%
Interest rate on new long-term debt	8.0%
Cost of equity	13.0%
Marginal tax rate	35.0%
Maximum acceptable payback period	2 years

Velasquez recognizes that Embelesado is currently financed at its target capital structure and expects that the capital structure will be maintained if the sailboat project is undertaken. Embelesado's managers disagree, however, about the method that should be used to evaluate capital budgeting proposals.

One of Embelesado's vice presidents asks Velasquez the following questions:

1. Will projects that meet a corporation's payback criterion for acceptance necessarily have a positive net present value (NPV)?
 2. For mutually exclusive projects, will the NPV and internal rate of return (IRR) methods necessarily agree on project ranking?
 3. For the sailboat project, what will be the effects of using accelerated depreciation (for both book and tax accounting) instead of straight-line depreciation on (a) the NPV and (b) the total net cash flow in the terminal year?
 4. Assuming a 13 percent discount rate, what will be the increase in the sailboat project's NPV if the expected market value of the facility at end of project is €15 million rather than €5 million?
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1. The weighted average cost of capital for Embelesado is *closest* to:
 - A. 10.78%.
 - B. 11.20%.
 - C. 11.85%.
 - D. 11.96%.
2. The total net cash flow (€millions) for the sailboat project in its terminal year is *closest* to:
 - A. 33.00.
 - B. 39.75.
 - C. 43.00.
 - D. 44.75.
3. The IRR for the sailboat project is *closest* to:
 - A. 18.5%.
 - B. 19.7%.
 - C. 20.3%.
 - D. 24.7%.
4. The *best* responses that Velasquez can make to question #1 and question #2 are:

	Question #1	Question #2
A.	No	No
B.	No	Yes
C.	Yes	No
D.	Yes	Yes

5. In response to question #3, what are the *most likely* effects on the NPV and the total net cash flow in the terminal year, respectively?

	NPV	Total net cash flow in terminal year
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

6. In response to question #4, the increase in the sailboat project's NPV (€millions) is *closest* to:
- A. 4.50.
 B. 6.50.
 C. 6.76.
 D. 6.93.

Solutions for Carlos Velasquez

1. B is correct. The weighted average cost of capital for Embelesado is calculated as:
- $$WACC = (\text{market weight of debt} \times \text{after-tax cost of debt}) + (\text{market weight of equity} \times \text{cost of equity})$$
- $$WACC = w_d k_d (1 - T) + w_{cs} k_{cs} = 0.231(8.0\%)(1 - 0.35) + 0.769(13.0\%) = 1.201\% + 9.997\%$$
- $$WACC = 11.198\% = 11.20\%$$

2. C is correct. The terminal year cash flow is:

Revenues	€60.00
Less operating costs	25.00
Less depreciation expenses	<u>20.00</u>
= Taxable Income	15.00
Less taxes @ 35%	<u>(5.25)</u>
= Net Income	9.75
Plus depreciation expenses	<u>20.00</u>
= After-tax operating CF	29.75
+ Recover WC	10.00
+ Ending market value	5.00
Less taxes on sale proceeds @ 35%	<u>(1.75)*</u>
= Terminal Year CF	€43.00

*The tax on the sale proceeds is 35% times the gain of €5.00 = €1.75

3. C is correct. This is the IRR for a project with the following cash flows: (€70,000) in Time 0, €29,750 at Times 1 and 2, and €43,000 at Time 3.

	<u>Years 1& 2</u>	<u>Year 3</u>
Revenues:	€60,000	€60,000
Less operating costs:	25,000	25,000
Less depreciation expense	<u>20,000</u>	<u>20,000</u>
= Taxable Income	15,000	15,000
Less taxes @ 35%	<u>5,250</u>	<u>5,250</u>
= Net Income	9,750	9,750
Plus depreciation expense	<u>20,000</u>	<u>20,000</u>
= After-tax operating CF	€29,750	29,750
+ Recover WC		10,000
+ Salvage Value		5,000
– Less Taxes on Sal. Value @ 35%		<u>1,750</u>
= Terminal Year CF		€43,000

The IRR of 20.29% is readily found with a financial calculator:

$$70,000 = \frac{29,750}{(1 + IRR)^1} + \frac{29,750}{(1 + IRR)^2} + \frac{43,000}{(1 + IRR)^3}$$

You can also “reverse-engineer” the answer using the choices given in the question.

4. A is correct. Projects with shorter paybacks do not necessarily have a positive NPV. For mutually exclusive projects, the NPV and IRR criteria will not necessarily provide the same project ranking.
5. B is correct. Additional depreciation in earlier time periods will shield Embelesado from additional taxes, thus increasing the net cash flows in earlier years of the project and increasing the project’s NPV. However, this also means that there will be less depreciation expense in the terminal year of the project, thus shielding less income and increasing taxes. Terminal-year net cash flow will likely decrease.
6. A is correct. The entire €10 million will be subject to taxes, resulting in an additional €6.5 million after taxes. As indicated below, when discounted at 13 percent for three years, this has a present value of €4.5048 (rounded to €4.50 millions):

$$PV = \frac{10.0(1 - 0.35)}{(1.13)^3} = \frac{6.50}{(1.13)^3} = 4.50$$

The following questions relate to Eero Jokinen.

Eero Jokinen is a portfolio manager at Northern Lights Pension Fund in Finland. Given the overall low level of interest rates currently in Europe, Jokinen is looking for ways to enhance the yield of Northern Lights’ portfolio. The investment guidelines have recently been amended to allow investments in corporate bonds and bonds with embedded options. Jokinen is analyzing three different bonds as possible investments for Northern Lights: Thor Products bonds, France Telecom bonds, and a particular dual currency bond.

Thor Products Bonds

Selected financial data for Thor Products are provided in Exhibit 1.

Exhibit 1
Selected Financial Data for Thor Products
(€thousands)

Balance Sheet			
Current assets	230	Current liabilities	120
Property, plant, and equipment	1,039	Long-term debt	850
		Shareholders’ equity	299
Total assets	1,269	Total debt and equity	1,269
Income Statement			
Sales			2,000
Cost of sales and operating expenses			1,400
Depreciation expense			200
Income from operations			400
Interest expense			75
Income tax expense			98
Net income			227

The covenants on Thor’s outstanding bonds require the company to maintain:

1. a dividend payout ratio below 30 percent.
2. an EBITDA interest coverage ratio of at least 3 times.
3. timely interest and principal payments.
4. a total debt-to-capitalization ratio of no more than 60 percent.

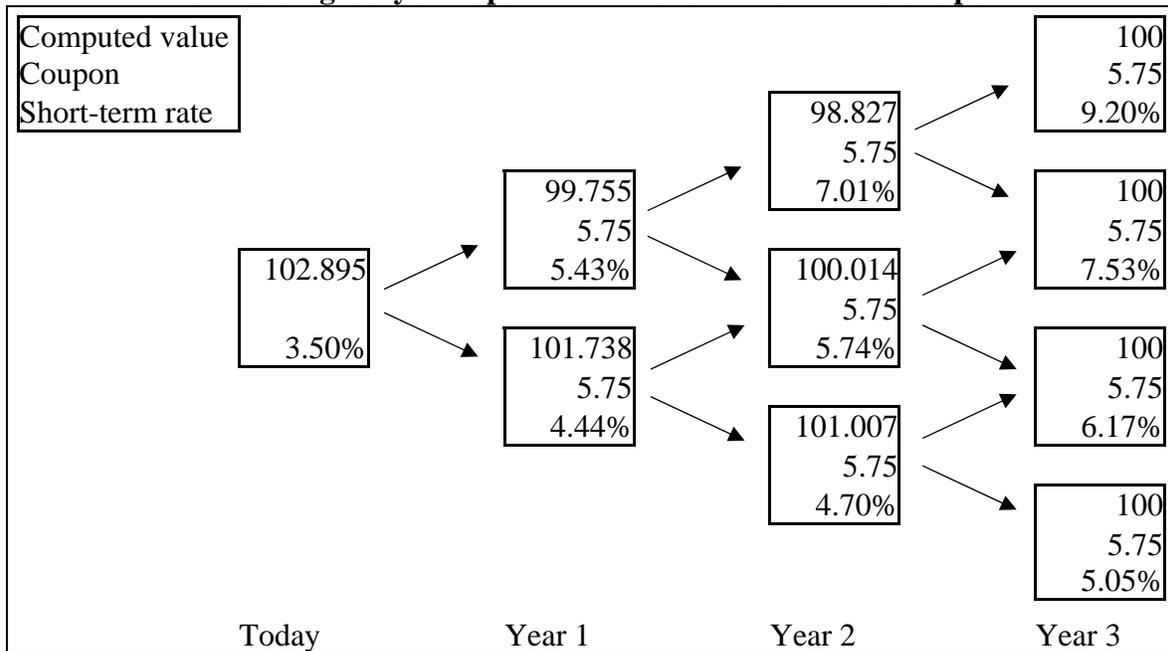
Jokinen expects that the current environment of low interest rates and low interest rate volatility may not continue. So, he analyzes the effects of an increase in interest rates and volatility on the value of any callable bonds in the portfolio. Jokinen states:

- “If interest rates rise and interest rate volatility remains unchanged, the value of callable bonds should decrease.”
- “If interest rate volatility increases and interest rates remain unchanged, the value of the callable bonds should increase.”

Jokinen will use a binomial model to value a Thor Products bond with a 5.75 percent coupon and

a maturity of 3 years. The bond is callable at par every year starting one year from now. Jokinen assumes that Thor would call the bonds if their price rose above par. A binomial interest rate tree for a noncallable Thor Products bond is shown in Exhibit 2. The probability of each interest rate move in the tree is 0.50.

Exhibit 2
Option-free Binomial Interest Rate Tree (10% volatility assumed)
for Valuing a 3-year Option-free Bond with a 5.75% Coupon



France Telecom Bonds

Jokinen is considering investing in a France Telecom (FRTEL) convertible bond because of the favorable outlook for the industry. His 12-month price forecast is €27.50 per FRTEL share. The convertible bond has the following characteristics:

- FRTEL 1.6% 01 January 2009.
- Conversion ratio is 100 shares per bond.
- Par value is €2,581.
- Current price of the bond is €2,825.
- FRTEL common stock has a current price of €25.75 per share and pays no dividend.
- Bond is callable at €2,581 on 31 December 2006.

Dual Currency Bond

Finally, Jokinen is considering a dual currency bond with coupon payments in euros and principal repayment in Turkish lira. He states that the bond would not have any currency exposure to the Turkish lira until it matured and the Turkish lira were actually paid.

1. The total debt-to-capitalization and the EBITDA interest coverage ratios for Thor Products are *closest* to:

	<u>Total debt-to- capitalization</u>	<u>EBITDA interest coverage</u>
A.	76.4%	5.3
B.	76.4%	8.0
C.	84.4%	5.3
D.	84.4%	8.0

2. Which of the four covenants on Thor's bonds is an affirmative covenant?
- A. #1
B. #2
C. #3
D. #4

3. Are Jokinen's statements regarding the effects on callable bonds of an increase in interest rates and an increase in interest rate volatility, respectively, correct?

	<u>Interest rates</u>	<u>Interest rate volatility</u>
A.	No	No
B.	No	Yes
C.	Yes	No
D.	Yes	Yes

4. From Exhibit 2, the current price of the Thor callable bond is *closest* to:

- A. 102.05.
B. 102.17.
C. 102.90.
D. 103.01.

5. The premium payback period (in years) for the France Telecom convertible bond is *closest* to:

- A. 0.14.
B. 1.60.
C. 1.81.
D. 6.05.

6. Is Jokinen's statement about the currency exposure to investing in the dual currency bond (euro and Turkish lira) correct?

- A. Yes.
B. No, the bond has exposure to the Turkish lira from the date of purchase.
C. No, the bond has appreciation exposure to the Turkish lira only at maturity.
D. No, the bond has depreciation exposure to the Turkish lira only at maturity.

Solutions for Eero Jokinen

1. B is correct. Total debt to capitalization = $(120 + 850)/(850 + 120 + 299) = 76.4\%$
EBITDA interest coverage = $(400+200)/75 = 8$
2. C is correct. Covenant #3, to pay interest and principal, is an affirmative covenant. The other three are negative covenants.
3. C is correct. A rise in interest rates will reduce the value of the bond. Jokinen’s first statement is correct. If volatility increases, the value of the callable bond will decrease because the owner will be short the option that will rise in value as the volatility increases. Therefore, Jokinen’s second statement is wrong.

4. A is correct. Replace all the bond values above par with 100 and recalculate the tree.

			100.000
		98.827	5.75
	99.748	5.75	9.20%
102.052	5.75	7.01%	
	5.43%		100.000
3.50%		100.000	5.75
	100.000	5.75	7.53%
	5.75	5.74%	
	4.44%		100.000
		100.000	5.75
		5.75	6.17%
		4.70%	
			100.000
			5.75
			5.05%
Today	Year 1	Year 2	Year 3

5. D is correct. The coupon interest = $€2581 \times 1.60\% = €41.30$
Favorable income differential per share = $[€41.30 - (100 \times 0)]/100 = €0.413$
Market conversion price = $(€825)/100 = €8.25$
The conversion premium per share = $€8.25 - €5.75 = €2.50$
Then the premium payback period = $€2.50/€0.413 = 6.05$ years.
6. B is correct. The bond has currency exposure to the Turkish lira from the date of purchase.