FINANCIAL RISK MANAGEMENT

ERASMUS

ASSIGNMENT B

*It should be returned electronically to my email (*[*dgeorg@aueb.gr*](mailto:dgeorg@aueb.gr) *– Subject: Erasmus B) by Jan. 19/2020. The performance to this assignment will account for 20% of your final evaluation.*

**Questions 4, 7, 8, 9, refer to material that we will discuss on our last meeting in 2020.**

Qu 1 ) Let the annual return of a government treasury bill and a 1-year BBB corporate commercial bill be 6.25% and 9.2% respectively. What is the implied 1-year probability of default if the Loss Given Default is 60%;

(Ass: investors are risk neutral)

*Formulas: *

Qu 2) A portfolio of bonds consists of five bonds whose default correlation is zero. The one-year probabilities of default of the bonds are : 1%, 2%, 5%, 10%, and 15%. What is the one-year probability of no default within the portfolio?

QU 3) If the cumulative probabilities that a debtor will default over the next two years is 3% and over the next three years 3.7%, calculate the conditional marginal probability that he will default the third year from now .

Qu 4) A FI has signed on 1/1/2011 a Foreign exchange forward contract, to buy 1 mil. USD on 1/4/2019 against CHF (swiss francs) at a rate 1.5 CHF per 1 USD. On 1/2/2019 the 2 months forward rate changed to 1.7 CHF per 1 USD. The 2 months Libor USD rate equals 5% (on an annual basis). Calculate the current replacement cost for the FI.

Qu5). Assume that a loan has the following characteristics:

• Gross revenue is expected to be $5.0 million.

• Interest expense is $3.0 million.

• economic capital is $6.0 million

• Expected loss on the loan is $250,000.

• Other costs associated with making the loan equal $1.0 million.

What is the risk-adjusted return on capital (RAROC) for this loan?

Qu 6) Assume a FI has claims amounting to 100 mil. Euros against a company. For these claims the FI has received collaterals with a current value of 120 mil. Euros. These collaterals have a standard deviation of returns equal to 7.15%. If the company has a risk to default next year of 5%, calculate the amount of additional collateral that it will be required from the bank if the s.d. of the collateral increases to 12%. Assume that the FI doesn’t want to suffer any loss with a probability 99.95% (Assume that the probability to default is independent from the change in the current value of the collateral).

(The 99% coefficient from the standard normal distribution is 2.33)

Qu 7) A FI facing a financing cost of Libor-5 basis points (b.p.) buys a corporate bond which offers a yield to maturity of Libor+30 b.p. According to the Basle Accords the issuer of this corporate bond has been assigned a risk weight of 20%. What is going to be the return of this corporate bond calculated with respect to the “charged” regulatory capital (coefficient 8% on risk weighted assets)?

Qu 8) Cite one reason that explains why the banking industry is heavily regulated

QU 9) You are given the Balance sheet of a F.I. (in brackets the risk weights applied from Basle I):

|  |  |  |  |
| --- | --- | --- | --- |
| Cash | 40 mil. (0%) | Deposits | 370 mil. |
| Municipal Loans | 60 mil. (20%) | Preference Shares | 20 mil. |
| Mortgage Loans | 100 mil. (50%) | Ordinary Shares | 10 mil. |
| Corporate Loans | 200 mil. (100%) |  |  |
|  |  |  |  |

You also know that the FI has: a) Letters of credit amounting 40 mil. which carry a “certainty equivalence” coefficient of 100% and b) Letters of credit related to commercial transactions which carry a “certainty equivalence” coefficient of 20%. Both Letters of credit contracts have been issued to companies which carry a risk weight of 50%.

What is the required Tier I regulatory capital (coefficient 6%)?

Qu 10) The shareholders of a FI require a risk adjusted return (RAROC) 10%. For a 10 mil. € loan the economic capital has been estimated to be 0.5 mil. € and the positive commissions from the loan are estimated to be 0.2% of the nominal value of the loan. Which should the interest rate charged on the loan be if the cost of funds for the FI is 2%?