

Undergraduation in Finance

Money and Banking

Exam – 20 January 2022

1. Explain the role of banks in the transmission of monetary policy effects and calculate the impact of an injection of 500 Million Euros of liquidity by the European Central Bank, through open market operations, assuming: **(3,0/20)**

- (i) reserve requirement rate = 1%
- (ii) coefficient of preference for central bank's money = 10%
- (iii) excess reserves coefficient = 5%

3 types of players in the money supply process:

- (i) Central Bank
- (ii) Banks
- (iii) Depositors

See calculations at the spreadsheet.

2. Considering the Financial Statements of Lisbon Bank below:

Balance Sheet

Assets	Dec 13	Dec 21	Liabilities + Capital	Dec 13	Dec 21
Cash and Claims on Central Banks	1	10	Resources from Central Banks	10	15
Claims in Other Credit Institutions	3	1	Resources from Other Credit Institutions	3	1
Securities, Derivatives and Investments	20	25	Resources from Customers	55	66
Net Credit to Customers	50	60	Liabilities represented by securities	5	2
Gross Credit (+)	60	65	Other liabilities	5	1
Impairments (-)	10	5			
Other Assets	16	4	Capital	12	15
Total	90	100	Total	90	100

Income Statement

	Dec 13	Dec 21
Net Interest Income	1,0	0,9
Income (net) from services and commissions	0,7	0,8
Income from financial operations	0,8	0,3
Gross Income	2,5	2,0
Operating Costs	1,2	0,7
Impairments	0,8	0,3
Income Before Tax	0,5	1,0
Taxes	0,05	0,1
Net Income	0,45	0,9

2.1. Assess the evolution of the profitability, by calculating its main performance ratios (2,0/20)

- see spreadsheet

2.2. Explain how the increase in credit risk impacted on these financial statements. (2,0/20)

- impairments – stage 1, 2 and 3

- higher capital requirements for NPE

2.3. Explain how did the growth in credit to customers impacted on the net income. (2,0/20)

- NII

- impairments

3. Consider the following 1-year rating transition matrix, published by Moody's, as well as the additional information provided:

Average one-year letter rating migration rates, 1920-2020

	Aa	A	Baa	Ba	B	Caa	Ca-C	WR	Def
AAA	7.65%	0.78%	0.18%	0.03%	0.00%	0.00%	0.00%	4.33%	0.00%
Aa	1.01%	84.32%	7.68%	0.70%	0.15%	0.04%	0.01%	6.02%	0.06%
A	0.06%	2.69%	85.47%	5.34%	0.60%	0.11%	0.03%	0.01%	5.61%
Baa	0.03%	0.21%	4.03%	83.60%	4.31%	0.68%	0.12%	0.02%	6.77%
Ba	0.01%	0.07%	0.46%	6.09%	74.40%	6.77%	0.68%	0.09%	10.36%
B	0.00%	0.04%	0.14%	0.58%	5.49%	71.97%	6.32%	0.47%	11.95%
Caa	0.00%	0.01%	0.02%	0.10%	0.42%	6.22%	68.80%	2.98%	14.07%
Ca-C	0.00%	0.01%	0.09%	0.08%	0.46%	2.63%	8.73%	45.62%	17.46%

Source: Moody's (2021)

3.1. What would be the minimum spread a bank should charge to grant a 1-year loan to a company in the lowest investment grade rating class, assuming: (1,5/20)

- LGD=20%

- ROE=10%
- capital requirement = 12%
- Operational Costs = 0,55%
- Funding Costs = Euribor + 3 pp.

$$s = Ca + ROE \cdot K + Cf + EL$$

$$s = ,0055 + ,1 \cdot ,12 + ,03 + 0,0023 \cdot ,2 = 4,796 \text{ p.p.}$$

3.2. What would be the risk-adjusted profitability if the bank decided to charge a spread = 4 p.p.? (1,5/20)

$$RAROC = \frac{s - Ca - Cf - EL}{K}$$

$$RAROC = (,04 - ,0055 - ,03 - ,0023 \cdot ,2) / ,12 = 3,37\%$$

$$= (0,03 - 0,005 - 0,04 - 0,017 \cdot 0,3) / 0,14$$

3.3. How would you consider information about the stock prices of this company in the decisions taken in the previous questions? (2,5/20)

- Describe Merton Model
- The Model would provide a PD estimate, to be used in EL

4. Consider the following information about Bank Tech (figures in Million €):

	<1week	1week-1month	1-3 months	3-6 months	6-12 months
Static Liquidity Gaps					
Marginal	100	200	-400	600	800
Cumulative	100	300	-100	500	1300
Static Interest Rate Gaps					
Marginal	200	150	300	500	800
Cumulative	200	350	650	1150	1950

4.1. Characterize the types of risks mentioned and assess the respective magnitudes, identifying the major resulting fragilities? (2,5/20)

- liquidity and interest rate risk
- liquidity shortfall up to 3 months => revision of Funding Plan
- bank exposed to interest rate decrease

4.2. Present and characterize the main alternative indicators to assess these risks. (1,5/20)

- interest rate risk: duration and convexity for marked-to-market assets and EaR for non-marked-to-market assets
- liquidity risk – regulatory ratios (e.g. LCR, NSFR) or volume of eligible collaterals to be used in loans from the central bank

4.3. How would an interest rate increase impact on the Net Income of the Bank? (1,5/20)

- Depends on whether we are referring to marked or non-marked-to-market-assets. For the former, it would impact adversely on the asset value. For the latter, with positive interest rate gaps, it would impact positively.

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