

Question: Fixed Income Valuation and Analysis**(39 points)**

You are working in the Treasury department of an international bank and are asked to come up with an analysis for the potential issuance of so-called “Contingent Convertible” (“CoCo”)-bonds.

Such deeply subordinated bonds qualify as Additional Tier 1 Capital for regulatory purposes as their nominal value will be written down (or converted into shares) if the bank’s CET1-ratio (Core Equity Tier 1 Ratio) falls below the given trigger level (see below notes for CET1 definition). In addition, coupons will in that case not be paid.

Your peer group comprises the following “CoCo”-bonds:

Issuer	Volume (EUR billion)	Coupon	Structure	Maturity to Call Date	CET1-Trigger	Yield-to-Call	Theoretical Price-to-Call
Barclays	1.00	8.00%	Perpetual Non-Call 7 years	7 years	7.000%	6.65%	①
Santander	1.50	6.25%	Perpetual Non-Call 5 years	5 years	5.125%	5.98%	101.14%
Societe Generale	1.00	6.75%	Perpetual Non-Call 7 years	7 years	5.125%	5.85%	105.05%
Deutsche Bank	1.75	6.00%	Perpetual Non-Call 8 years	8 years	5.125%	5.92%	②

Notes: - **The Core Equity Tier 1 ratio** (CET1 ratio) is the Core Equity Tier 1 capital (CET1) divided by the Risk Weighted Asset (RWA). Or, simply, the ratio CET1 / RWA.

- **The CET1 trigger level** is the level of the CET1 ratio below which the CoCo bond is written down (i.e. when CET1 ratio < trigger level, which is usually fixed at 7% for a high trigger and 5.125% for a low trigger).

- Assume identical issuance dates, similar ratings, same CET1 definitions, annual coupon frequencies, same write-down structures (i.e. no share conversion) pertaining to all given “CoCo”-bonds above.

a) Firstly, you are asked to answer some basic questions.

a1) Calculate the 2 missing “Theoretical Price-to-Call” values ① and ② according to the data given in the table above. [Hint: The “Theoretical Price-to-Call” is the price of the bond if it were called at par at the given Call Date with the given Yield-to-Call.]

(6 points)

a2) Calculate the pro-forma Leverage-Ratio for Deutsche Bank before and after the issuance of a EUR 1.75 billion “CoCo”-bond. (Leverage-Ratio = Tier 1 capital / Leverage exposure; Tier 1 capital prior to issuance: EUR 46.85 billion; Leverage exposure prior & post to issuance: EUR 1,423 billion.)

(4 points)

- a3) Which of the above mentioned “CoCo”-bonds has the highest modified Duration and Convexity? For your answer, assume that the Coco’s mature at the call date. (provide a short reasoning – no calculation required) (5 points)
- b) Secondly, you are asked to further analyze the Yield-to-Calls of the given “CoCo”-bonds:
- b1) Barclays’ “CoCo”-bond offers the highest Yield-to-Call among the given bonds: What is the main reason for this fact? (short reasoning – no calculation – required) (5 points)
- b2) What are, in general, the main determinants of the Yield-to-Call of a newly issued “CoCo” bond? Give 4 determinants. (4 points)
- c) Finally, you are required to assess the risk/return exposure of “CoCo”-bonds:
- c1) What is the main reason for the strong demand for such “CoCo”-bonds from an investor perspective? Explain. (4 points)
- c2) What are, in general, the main risk factors of a “CoCo”-bond from an investor perspective other than interest rate risk? List 3 of them. (6 points)
- c3) Why do banks issue such comparatively expensive “CoCo”-bonds? (5 points)