



FIN382
**Risk Management for Finance and
Technology**

Tutor-Marked Assignment
January 2021 Presentation

TUTOR-MARKED ASSIGNMENT (TMA)

This assignment is worth **18%** of the final mark for **FIN382 Risk Management for Finance and Technology**.

The cut-off date for this assignment is **6 April 2021, 2355 hrs**.

Note to Students:

You are to include the following particulars in your submission: Course Code, Title of the TMA, SUSS PI No., Your Name, and Submission Date.

You must answer ALL questions. (Total 100 marks)

Question 1

You have been hired to advise the executive team of a construction and engineering firm on risk matters. On the first week of work, you had to answer a broad range of questions on risk management. To address those, you had to remember some of the practical lessons from your studies at SUSS.

Mrs. Loo, the Chief Operations Officer, has asked you to prioritise **five (5)** different risks:

- (i) A possible billing dispute with a local developer over a serious \$ amount
- (ii) An unlikely accident on one of the sites endangering the lives of the neighbourhood
- (iii) A routine rise in foreign workers' wages, which will affect the profit margin by 0.03%
- (iv) The final adoption of a new law forcing construction firms to contribute 5% of their profit to an environmental preservation fund
- (v) A projected 50% decline in long-term demand for office space, which represents 90% of the firm's revenues

- (a) Analyse the different risks by plotting them on a risk matrix.

(10 marks)

Mr. Rao, the Chief Financial Officer, is thinking to hedge the firm's interest rate risk on the market and would like to understand the workings of forward and futures markets.

- (b) Compare briefly the pros and cons of forwards and futures in risk management terms.

(5 marks)

Mrs. Patel, the Chief Communications Officer, has to provide an assessment of the Singapore construction sector risk profile to potential investors coming from Sydney, Australia.

- (c) Distinguish at least one (1) strength, **one (1)** weakness, **one (1)** opportunity and **one (1)** threat for Singapore construction industry players by using the PESTEL framework.

(10 marks)

Question 2

A firm holds a bond with a value of \$150 million and an estimated probability of default of 4% over the coming 12 months. The policy of the firm sets its risk limit to 95% VaR (Value at Risk) and 95% ES (expected shortfall) for any individual security. Assume the bond bears **no** risk of loss due changes in the market price **or** in the traded value.

- (a) Categorise the exact class of risk to which the bond is exposed here. (3 marks)
- (b) Compute the 95% VaR measure for this bond and explain your result. (7 marks)
- (c) Compute the 95% ES measure for this bond and explain your result. (10 marks)
- (d) Assume now that the confidence level is increased to 99% on both limits. Compute the new VaR and ES measures and explain your results. (5 marks)

Question 3

You are reviewing the residential mortgage loan portfolio of a well-known Singapore-based bank. The purpose of your analysis is to establish the capital adequacy of the institution and its ability to withstand a major crisis.

The exposure of the residential mortgage loan portfolio of the bank is reported at \$135,000 million. The probability of default over the next year is estimated at 0.5% and the probability of default over the next 15 years is estimated at 4%. The estimated recovery value in case of default is 70% before insurance against default is taken by the lender. 20% of the portfolio is covered by a **risk-free** insurance firm.

- (a) Compute the expected loss of the bank's mortgage portfolio. (10 marks)

The risk-weight of the mortgage portfolio is 20%. Aside from the mortgage portfolio, the bank has \$55,000 millions of RWA over its corporate and investment banking business unit and lesser portfolios. The bank common equity is \$12 billion. The bank has issued \$2 billion in eligible preferred stocks and another \$1 billion in contingent convertibles. The bank has finally \$5 billion in subordinated debt, half of them qualifying for capital recognition.

- (b) Compute the % total capital ratio of the bank, differentiate the different tiers and appraise whether the financial institution is adequately capitalised. (15 marks)

You have read about the concept of “Black Swan”. You now wonder if the COVID-19 pandemic could be described as a typical Black Swan event.

- (c) Indicate the key criteria of a Black Swan event and the differences with those of a known event or an extreme yet plausible event. (10 marks)
- (d) Demonstrate whether the sudden spread of the COVID-19 pandemic can be defined as a Black Swan event. (15 marks)

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