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**Interest Rate and Credit Risk Models**

**2023/2024**

**Exercise 2**

1. Using the Merton Model, present estimates for the 1-year probability of default of a company listed in the Eurostoxx 50 Index, since the beginning of the pandemic, for at least 5 different dates, detailing the assumptions taken and discussing the results obtained. (6/20)
2. How would you use information provided by rating agencies to get these estimates? (3/20)

* Frequencies of default for a given maturity, namely from transition matrices or time-series data, or cumulative frequencies of default.

1. Identify the main differences between the estimates obtained in the two previous questions and describe how would you compare the performance of the Merton Model to rating agencies. (5/20)

* Merton model is based on stock prices, while external ratings are the outcome of a comprehensive assessment performed by rating agencies about the financials of a company and its operating environment.
* Merton model is a point-in-time model while external ratings result from a through-the-cycle assessment.
* Therefore, Merton model tend to provide more volatile results for the PDs.

1. Calculate the spread to be charged on a CDS on the debt issued by the company considered in the first question, taking into account adequate assumptions. (6/20)