RISK MANAGEMENT

Module 3, 2022/23

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Course information

Course Website:

Instructor's Office Hours: by request

Class Time:

Room Number:

TAs:

Course description

This course will provide you with effective tools of managing risks faced by the firm. We examine a broad range of risks: from financial risks measured by statistical models to those risks, which are hard to quantify but are nevertheless very important for the firm. The course structure is based on a holistic framework of the enterprise-wide risk management (ERM), which includes identification, evaluation, treatment, and monitoring of risks. We start with motivation for risk management in a corporation, discussing various types of risks and basic approaches to deal with these risks. The core of the course is the measurement of market and credit risk using Value at Risk (VaR) and other metrics. In addition to that, we discuss how to evaluate operational, political, and other 'soft' risks. Finally, we consider the execution of risk strategy in a company using the ERM approach, with the focus on the role of CRO. Selected business cases and guest speakers from the industry will illustrate how these concepts are used in practice.

Course requirements, grading, and attendance policies

The course grade will be based on two individual home assignments (20%), three cases (30%) and closed-book final exam (50%).

Cases must be prepared in groups of up to 4 people. Work on the case involves preliminary group discussion, writing a case report answering given questions, and being ready to present your solution in the class with slides. The case report should contain problem statement (including relevant information from the case), analysis (assumptions, arguments, computations, optimal and alternative solutions), and conclusions (summary of your logic and recommendations). It should be written as executive report to your superior; the maximum

length is 3 pages (all tables and supporting data can be put into a separate appendix). The report must be based on information contained in the case and your own analysis, not on someone else's solutions that may be available at the web (I will check those to ensure there are no similarities). It should be submitted by the beginning of the class discussing the case. Each case contributes 10% to the total points for the grade. *If someone is not ready to discuss the case in the class and cannot answer two questions in a row, he or she receives zero points for a given case.*

To pass the course, one should score at least 30% for the exam. Those attending less than 50% of the lectures will not be allowed to take a make-up exam. Active class participation may add up to 5% bonus points (note that quality rather than quantity of your interventions will count).

Course contents

Class	Topic	Reading
1-2	Motivation for risk management. Mapping risks that corporations face. Main methods of treating risks. Risk management as a part of corporate strategy. The enterprise risk management (ERM) approach.	[3] ch.1-2
3-4	*Hand in home assignment 1: case on market risk* Measuring market risk: exposure, volatility, VaR (delta-normal, historical, and Monte Carlo approaches). Back-testing.	[1] ch.9-10, 14-15, 21 [2] ch.20-21 [3] ch.7
5-6	*Hand in home assignment 2: market risk VaR* Market risk: practical aspects and post-crisis changes. Alternative risk measures. Model risk. Liquidity risk. Stress testing. Mini-cases: *LTCM, Lehman Brothers*	[1] ch.6.5, 19, 22 [3] ch.7, 14
7-8	*Hand in home assignment 3: case on credit risk* Specifics of credit risk. Modeling credit risk: recovery rate, credit exposure and probability of default. Credit ratings.	[1] ch.16 [2] ch.22 [3] ch.10
9-10	*Hand in home assignment 4: CreditMetrics* The advanced modeling of credit risk: scoring models, credit spread, CreditMetrics, etc.	[1] ch.18 [2] ch.22
11-12	*Hand in home assignment 5: case on op risk* Operational risk. Mini-cases: *Barings, Madoff*	[1] ch.20 [3] ch.13
13-14	Managing 'soft' risks such as political risk. Implementing ERM in practice. Role of CRO. Risk dashboard, KRI and EWI. Risk-adjusted performance measures such as RAROC. Mini-case: *Hydro One*	[1] ch.23-24 [2] ch.34 [3] ch.4, 15

Description of course methodology

Main topics and selected cases will be studied during the lectures. Students should be prepared to discuss the cases and present case solutions. Seminars will be devoted to discussions of

various examples, problems, applied materials, etc. Students are expected to effectively prepare to each class by doing pre-reading of the assigned materials. Before each class, I will send you information about the upcoming class: required and optional readings, questions for self-preparation (what you should learn before the class), home assignments and cases.

Sample tasks for course evaluation

Sample question from the home assignment:
Compute 5% VaR for 1-day horizon for each day over your sample period (except for the first year necessary for initial calculations) using the following approaches:
- Historical modeling with 1 year sample period
- Filtered historical modeling with 1 year sample period
- Delta-normal approach with simple volatility computed in the previous question
- Delta-normal approach with EWMA volatility computed in the previous question

Sample question from the case:
Assess the GGC loan proposal by discussing its advantages and potential risks. Analyze the economic revenue and profit from the deal calculated by the bank's managers. Which factors may make these numbers lower than expected? Should Wellfleet accept the deal or not?

Sample questions from the exam:
- Name a risk measure, which measures sensitivity of the bond's price to interest rate changes.
- Why do risk managers often use EWMA (a simpler model) rather than GARCH (a more general model) to measure volatility? Provide a rational explanation.
- What is the main drawback of the delta-normal method applied to a large portfolio?
- Describe a trading strategy that may be used to manipulate VaR.
- How do banks usually solve the problem of model risk when measuring VaR?
- Many experts like to stress the importance of "black swans" or "unknown unknowns" (when we haven't even thought of the possible event) for the corporate risk management. How can a company deal with this? Suggest and discuss at least three different approaches.

Course materials

Required textbooks and materials

1. Hull, John C., Risk Management and Financial Institutions, Prentice-Hall.
2. Hull, John C., Options, Futures, and Other Derivatives, Prentice-Hall.
3. Круи, М., Галай, Д., Марк, Р., 2011, Основы риск-менеджмента, Юрайт.

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.