**Research direction and plan**

I have a strong interest in the direction of financial risk management. In recent years, due to COVID-19, the intensification of strategic games between major countries and geopolitical and military conflicts, the global economy has seen a trend of anti-globalization. Accompanied by the global economic recession, the rise of trade protectionism, and the volatility of the financial market, the international financial risk has become increasingly complex. Large multinational enterprises, financial institutions, governments and financial regulators are seeking new and effective financial risk management theories and techniques to safeguard financial security.

The financial risk system is divided into risk identification, risk assessment and risk control. I would like to focus my research on the risk assessment aspect of financial products, i.e., predicting and evaluating the possibility of the occurrence of financial risk or the degree of loss of the product, and quantitatively analyzing the possibility of the occurrence of different degrees of loss and the consequences of the loss.

In terms of analyzing the likelihood of occurrence of financial risks, I intend to systematically collect historical data on the occurrence of risk factors, build a statistical regression model, and use these data to fit the coefficients to be determined for this model, which can predict the probability of occurrence of different risk factors in the future.

In terms of the degree of financial risk loss, I intend to use the amount of loss as a criterion, where the size of the loss represents the magnitude of the loss. Similarly, I will collect data, perform regression analysis, and build a probability distribution model of the loss amount, which will be used to predict the degree of loss of the risk.

If possible, I will expand the scope of the study to include a financial system as the object of study, and in turn study the systemic risk of this financial system. The real financial system is a complex system that interacts with each other, so I intend to reasonably simplify the real financial system, retaining only the most important parts, find the various risk factors that may arise when this system is in operation, and study the probability of occurrence and the degree of loss of these potential risk factors.

In this process, choosing which parts of the system to keep is the first difficult part for me, and I may need guidance from my professor. And choosing what kind of mathematical model to build to describe the probability of occurrence and the degree of loss of these potential risk factors in the operation of the financial system is the second difficult point for me, and I need to learn more mathematical methods and computer techniques to solve this difficult problem.

For a financial product, its risks are independent, which means that different risk factors do not interfere with each other, which greatly reduces the difficulty of the research. For a real financial system, on the other hand, there is a great possibility that the various potential risks generated during its operation, will affect each other. For example, a certain risk factor A, if risk factor A occurs, may directly lead to the occurrence of risk factor B, may also lead to the occurrence of risk factor C probability has increased, may also lead to the loss of the degree of D increased, and so on. If a mathematical prediction model with reference value is to be built, it is necessary to take into account these complex interacting risk factors and try to eliminate their interference. Whether conditions should be set to eliminate these disturbances before building the model, or whether such disturbances should be added to the model as a factor to be considered, is the third difficult point for me.

In the next two years, I will keep learning and accumulating some mathematical models and data analysis methods, and at the same time, I will actively discuss with my professors, so that I can make a little achievement in this direction of financial risk.