

## Graduate Statement of Purpose

Ever since I was a child, I have held a strong interest in the finance industry and especially investment. Due to my interest in investment, I first stated investing when I was in high school. Initially, I was interested in investment method using business analysis with financial statements analysis. However, while I was investing in financial products such as stocks and options, there were many situations that I felt required a quantitative approach.

During the sub-prime mortgage crisis, the huge decline in stock markets meant that the return of my portfolio decreased sharply. Based on this experience, I wanted to prevent a huge portfolio loss during my investment period. Thus, when the Euro Zone crisis happened, I tried to hedge the risk of my portfolio with derivatives. Moreover, I tried to implement a risk-neutral strategy such as a long short stocks strategy to protect my portfolio return from huge loss due to an unexpected crisis. While implementing risk-neutral investment and hedge strategies, I realized the critical need for an advanced understanding of derivatives and risk management.

Meanwhile, optimization was another issue that I felt required a quantitative approach. During my investment period, I have always confronted the problems of how to optimize portfolio return with low risk. However, I could not identify an ideal answer from financial statement analysis. Therefore, I became more interested in quantitative approach in finance. This is why I am now applying to the Columbia University Financial Mathematics Program.

Columbia University is my ideal option due to its prestigious reputation for math and finance. Additionally, it offers a broad and flexible selection of financial mathematics courses and a great location for securing a job. Given my long held interest in investment, I want to learn more about quantitative approaches for asset management such as risk management. Indeed, due to the significant crisis during my investment period, I understand the importance of risk management when it comes to portfolio management and seek to become a more adept portfolio manager. I also aim to hone my understanding of financial derivatives and many investment and hedging strategies using derivatives.

While completing financial derivatives classes during my undergraduate study, I had the chance to simulate derivatives trading strategies. Specifically, I used real data from Bloomberg and I developed an interest in trading strategies using derivatives. I now want to study more about quantitative investment strategies for diverse asset classes such as commodities and currency. However, my interest areas are not bound to these subjects, and credit rating is another area that I aim to explore further. In fact, during the EURO Zone crisis, I became interested in the idea of investing credit spread and it would be fascinating to learn more about credit ratings and associated investment strategies. Seeking firsthand insight, I worked as a statistics assistant for business analysis at the central bank of Korea and currently work as a research assistant at one of the best credit rating firms in Korea.

Furthermore, to study quantitative finance, I completed numerous finance and economics courses. Meanwhile, I strengthened my quantitative skills by taking from basic math courses such as calculus along with advanced math courses such as probability theory and differential equation. I also passed the FRM exam, which offered a deeper understanding of quantitative approach for finance. I then studied MATLAB and object oriented programming to enhance my programming skills. As I progressed, I was eventually able to simulate an investment strategy using C language. To improve these computer skills, I plan to study C++, VBA and other programming language such as R before I join the financial engineering program.

As I look to the future, my career goal after graduation from Columbia University is to become a quantitative researcher for investments. Given my fervent interest in stock markets, I want to implement a diverse stock investment strategy such as momentum strategy and long short strategy using quantitative skills. Further, I became really interested in the idea of investing in the credit spread of bonds after experiencing Euro Zone crisis and noticing credit spreads between high rated bonds and low rated bonds became bigger during crisis. Thus, it would be interesting to find investment opportunities with credit ratings.

In sum, it is with this background, mindset, and focus that I aim to be an asset to your program and a strong contributor to the dynamic field of financial mathematics.