

Mizuho-DL Financial Technology receives patents both in Japan and in the United States
for a method of measuring credit portfolio risks

Mizuho-DL Financial Technology (Mizuho-DL FT) has recently received patents in Japan and in the United States for a method of rapidly and accurately calculating credit risks of a portfolio. A summary of the patented invention is as follows.

1. Background for receiving the patents

Many financial institutions including banks monitor credit risks (risks of incurring a loss due to the deterioration of obligors' financial conditions) of their credit portfolios on a regular basis, and use that information in making various business decisions. The most familiar measures for quantifying credit risks are Value-at-Risk (VaR) and Conditional VaR (CVaR), among which VaR represents the maximum loss incurred by a financial institution with a pre-specified probability (ex. 99%). Monte Carlo (MC) simulation is the method which is most widely used for calculating those risk measures. However, while you can deal flexibly with various risk factors with MC simulation, you have to increase calculation time to sufficiently decrease the statistical error of risk measures, and vice versa. This well-known trade-off raises some problems in credit risk management. For example, if statistical errors are not negligible, you can not determine whether an intertemporal difference of risk measures reflects a real change of credit risks or is merely due to a statistical error. Moreover, if calculation time is too long, you can not repeatedly perform "what-if" analyses like buy-and-sell simulations of assets many times to decide the best operation for optimizing a portfolio.

2. Brief summary of the patented invention

The patented invention resolves the above problems by introducing a state-of-the-art "Analytical Method" and thereby enabling a highly accurate calculation of risk measures in a very short time. In general, you have to know the probability distribution of the profit or loss of a portfolio to calculate risk measures. While MC simulation outputs a probability distribution that inevitably contains statistical errors caused by random numbers, "Analytical Method" deals with an exact formula representing the probability distribution. The high-speed and high-accuracy are realized by the patented method because it essentially does not rely on random numbers and numerically calculates the exact formula derived from probability theory, keeping errors involved in the calculation process as small as possible.

Another notable feature of the patented invention is that it enables calculating risk contributions which are results of a reasonable VaR (or CVaR) allocation to individual assets. It is very time-consuming, if not impossible, to calculate risk contributions with

MC simulation. In contrast, “Analytical Method” realizes a high-speed allocation to all assets even in a large portfolio with more than hundreds of thousands of obligors. Risk contributions provide for useful information about how the VaR or CVaR of a portfolio is affected when buying or selling assets. That information in turn supports reasonable decision-making on active portfolio management.

For details of the patented invention, search for information on the web site of United States Patent and Trademark Office using the following keywords¹.

- Patent number: 7,627,511
- Issue date: December 1, 2009
- Patent name: Method and apparatus for calculating credit risk of portfolio

3. Our future business plan

We are confident that the patented invention not only has technological originalities but also outperform existing methods in its applicability to risk management practice. We will promote, through dialogue with users and financial institutions, the usefulness of the patented invention in credit risk management and thereby create new business opportunities in Japan and in the U.S. We also continue research and development of the patented method to meet potential needs of our clients.

It is quite meaningful, we believe, that patents are awarded not only in Japan but also in the U.S. to a Japanese financial technology developed by us. As globalization and calls for more sophisticated risk management prompt financial businesses to be more complex than before, we will continue to contribute as before to the financial industry not only in Japan but also worldwide, cooperating with our partners by way of leveraging our expertise in mathematical technologies.

4. Our products and contact information

The patented invention has already been implemented in a credit risk measurement system (product name is “Super CreditGauge”) which was developed by Mizuho-DL FT and is now being used by some financial firms in Mizuho Financial Group. For more details on the patented invention and “Super CreditGauge,” please feel free to contact us.

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¹ Mizuho-DL FT intends to aggressively protect its intellectual properties. Without authorization from Mizuho-DL FT, using the patented invention in financial institutions, or making, selling and using of software that falls within the scope of the patented invention infringes our patents in the U.S. and Japan.