V. Conclusion

The market for CDS contracts has grown dramatically in the past years, and a market for CDS options is developing. The most liquid European CDS options are usually of short maturities. This may stem from that options with longer maturity have to bear more default risk by the reference company. Despite American CDS options do not exist yet, this type of options allows the holders to exercise before options mature so that the holders can avoid suffering loss from options being knocked out. In other words, the early-exercise feature greatly lowers the risk that the option becomes worthless during the option maturity. While the creation of a CDS contract is to provide the insurance against the default by a company on a particular bond, the early-exercise feature of a CDS option is to prevent the holder from losing the option.

Brigo (2006) provides a dynamic programming to price an American CDS option. However, this method is difficult to understand and apply to a valuation. We combine one-period CDS spread model developed by Brigo (2004) and least-squares Monte Carlo simulation presented by Longstaff F. A. and E. S. Schwartz (2001) to price an American CDS option. The main assumption of one-period CDS spread model is that the dynamics of one-period CDS spreads follow martingales under respective probability measure and these spreads are lognormally distributed. The primary advantage of this method is that the one-period CDS spread model is quite similar with the LIBOR market model. We can easily price a CDS-related product with the similar ideas.

Our numerical examples show that early-exercise premium does not appear when the option maturity is short. Once option maturity of a CDS option gets longer, the early-exercise premium has a dramatic impact on the option values. Therefore, the difference in value between European CDS options and Bermudan or American CDS options This also implies that the early-exercise characteristic indeed prevents CDS options from being knocked out.

As for the sensitivity analysis, the option values are more sensitive to the market quotes for CDS contracts than the volatilities of one-period CDS spreads, and American and Bermudan CDS options are more sensitive when these two variables move upwards.