Abstract

Immunization strategies are portfolio construction techniques minimizing the interest rate risk of a company’s surplus over time. The interest rate risk arises from the fact that the future value of both assets and liabilities are sensitive to future interest rates movements, which are uncertain. An immunized portfolio will make sure that both assets and liabilities react in a similar manner to shocks on interest rates, having the smallest impact on the associated surplus. Although the concept of immunization is very old, dating back the the 1950’s, the idea is still widely used today. In this project, we analyze and implement recently proposed portfolio immunization techniques, as well as the more older and standard ones. As the old approaches are extensively used across asset-managers, it is of interest to explore was has been brought forward in the recent years. Theoretical setups are explicitly derived to fully grasp the logic behind each approach, to then be able to apply it in practical contexts. The goal is not to find the best approach, but to compare them and find out their advantage(s) and disadvantage(s), theoretically, but also in practice. We find that the main differences between the more sophisticated techniques and the standard one come from the added handling of data. For example, parametric immunization requires a good yield curve model and an efficient way to estimate it, which may become problematic when the yield curve behaves strangely (multiple humps). However, it is also shown that this added effort helps reduce the volatility of the asset portfolio around the liability benchmark, especially for methods hedging multiple part of the discount rate curve. This study is done via an internship in the Liability-Driven Investment team at Fiera Capital, in Canada.