Fixed Income

Excel Problem Set 7 *Due: October 25, 2020, 17:00 Arizona time*

Individual problem set – do not work on with classmates. Submit each question in a separate worksheet in a single Excel file.

1. Today is Tuesday, November 8, 2022. The $4\frac{7}{8}\%$ May 15 2051 US Treasury bond is quoted: 98-22+ (bid) – 98-23+ (ask).

   (a) What is this bond's duration, computed analytically?

   (b) What is this bond's DV01, computed analytically?

   (c) What is this bond's DV01, computed numerically?

2. *(Zero DV01 convergence trade)* Today is Wednesday, November 30, 2022. The on-the-run 10-year Treasury note, the $5\frac{3}{8}\%$ November 15, 2032 note is quoted: 100-27+ (bid) – 100-28 (ask). The first off the run note is the $4\frac{1}{2}\%$ August 15 2032 note, quoted at 92-12 – 92-13. The general collateral repo rate is 3.5% (bid) – 3.45% (asked). The on the run note is trading on special in repo for 330 basis points. You work for a hedge fund that uses 9% as its cost of capital.

   Form a duration-neutral convergence trade to try to pick up the on the run premium. (That is the portfolio should have 0 DV01.) You plan to close the positions on Monday, February 20, 2023, so the repo arrangements are all for the full term of the trade.

   Show the P&L from your convergence trade under two scenarios:

   (a) On February 20, 2023 the continuously compounded yield to maturity on both notes is 4.2%

   (b) On February 20, 2023 the continuously compounded yield to maturity on both notes is 6.2%