MTH9897, 20240910, Homework 1.

CREDIT CURVE ARBITRAGE

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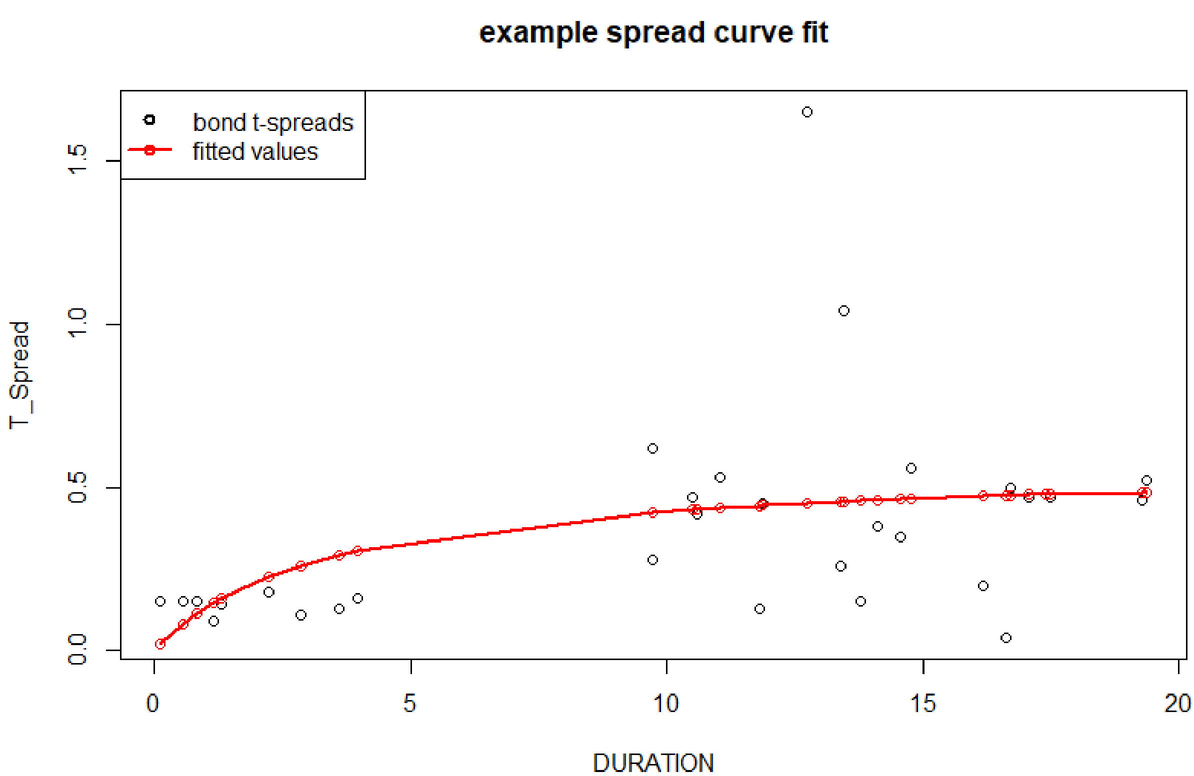
1. Download from WRDS enhanced end of month data for 4+ of your favorite large issuers(e.g. MSFT, AAPL) for a period of year+:
    - https://wrds-www.wharton.upenn.edu/pages/get-data/wrds-bond-returns/wrds-bond-returns/
    - Make sure your issuers have enough bonds to cover maturity spectrum.
    - Dataset covers up to 09/2022, so choose earlier days
2. Filter data: SECURITY_LEVEL to have same value across all bonds
3. Plot Treasury spread T_Spread vs DURATION for each issuer
4. Use basis of your choice to fit the spread curve with a 3 parameter model of YOUR CHOICE
    - E.g. spread = a + b*log(1+TMT)+ c*TMT + d*coupon , as shown in the example below
    - Consider weighting regression on reliable points (actively traded, large issues)
    - take a look at outliers: is there anything special about these bonds?
5. Built a duration-neutral portfolio (short rich bonds, long cheap bonds)
    - Monthly rebalance as data allows
6. Evaluate its return, PNL, turnover etc on the next month data.
    - Make necessary assumptions.
    - make sure it includes accruals (or add them yourself as a 1/12 of a coupon)
    - Summarize your finding



DATE	9/30/2022	9/30/2022	9/30/2022	9/30/2022
ISSUE_ID	592367	592369	610231	610233
CUSIP	037833AK6	037833AL4	037833AS9	037833AT7
ISIN	US037833AK68	US037833AL42	US037833AS94	US037833AT77
company_symbol	**AAPL**	**AAPL**	**AAPL**	**AAPL**
BOND_TYPE	**CDEB**	**CDEB**	**CDEB**	**CDEB**
SECURITY_LEVEL	**SEN**	**SEN**	**SEN**	**SEN**
CONV	**0**	**0**	**0**	**0**
OFFERING_DATE	4/30/2013	4/30/2013	4/29/2014	4/29/2014
OFFERING_AMT	5500000	3000000	2500000	1000000
OFFERING_PRICE	99.867	99.418	99.916	99.459
PRINCIPAL_AMT	1000	1000	1000	1000
MATURITY	5/3/2023	5/4/2043	5/6/2024	5/6/2044
TREASURY_MATURITY	912828UN8	912828QY7		
COUPON	2.4	3.85	3.45	4.45
DATED_DATE	5/3/2013	5/3/2013	5/6/2014	5/6/2014
AMOUNT_OUTSTANDING	5500000	3000000	2500000	1000000
R_MR	AAA	AAA	AAA	AAA
RATING_NUM	2	2	2	2
RATING_CLASS	0.IG	0.IG	0.IG	0.IG
T_DATE	9/30/2022	9/30/2022	9/30/2022	9/30/2022
T_Volume	**$225,080,000**	**$195,297,000**	**$96,807,000**	**$82,047,000**
T_DVolume	$222,956,837	$169,760,832	$95,793,339	$78,931,781
T_Spread	**0.09%**	**0.39%**	**0.12%**	**0.54%**
T_Yld_Pt	3.9827	4.8594	4.1282	4.7309
YIELD	4.19%	5.08%	4.42%	5.02%
PRICE_EOM	98.95	84.38	98.5	92.54
PRICE_LDM	98.95	84.38	98.5	92.54
PRICE_L5M	98.95	84.38	98.5	92.54
GAP	1	1	1	1
coupmonth	106	106	94	94
nextcoup	11/3/2022	11/4/2022	11/6/2022	11/6/2022
COUPAMT	0	0	0	0
COUPACC	0.99	1.57	1.39	1.79
RET_EOM	-0.20%	-8.37%	-1.15%	-6.91%
TMT	**0.6**	**20.89**	**1.62**	**21.91**
REMCOUPS	2	42	4	44
DURATION	**0.58**	**13.19**	**1.52**	**13.18**